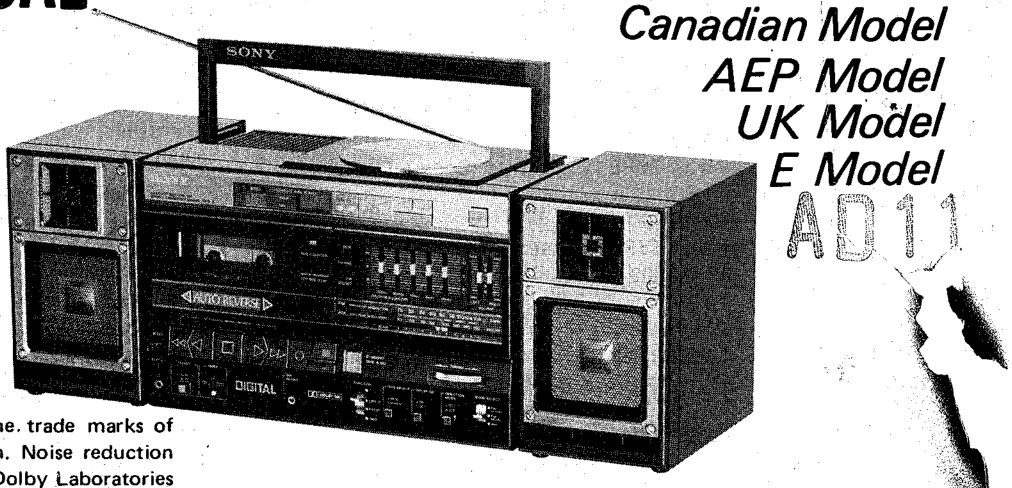
CFD-5

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model
E Model

AD11



'Dolby' and the double-D symbol are the trade marks of Dolby Laboratories Licensing Corporation. Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.

SPECIFICATIONS

Tape Transport Mechanism Tape	MF-CFD5-73

CD player section

System	Compact disc digital audio system
Disc	Compact disc
Laser diode properties	Material: GaAlAs Wavelength: 780 nm Emission duration: Continuous Laser output: Max. 0.4 mW * *This output is the value measured at a distance of about 1.6 mm from the objective lens surface on the optical pick-up block.
Spindle speed	200 r.p.m. to 500 r.p.m.(CLV)
Scan velocity	1.2–1.4 m/sec.
Error correction	Sony Super Strategy Cross Interleave Read Solomon Code
Number of channels	2
D-A conversion	16-bit linear
Frequency response	20–20,000 Hz $^{+1}_{-3}$ dB
Harmonic distortion	0.008% (1 kHz)
Dynamic range	90 dB (1 kHz)
Channel separation	85 dB (1 kHz)
Wow and flutter	Below measurable limit
Disc	
Track pitch	1.6 μm
Sampling frequency	44.1 kHz
Quantization	16 bit linear quantizing/channel
Modulation system	EFM
Transfer rate	2.03 Mbit/sec. (before modulation)

MICROFILM

Radio section

Frequency range	FM: 87.6–107 MHz (the model for West Germany) 87.6–108 MHz (the model for other countries) AM: 530–1,605 kHz (566–187 m)
Antennas	FM: Telescopic antenna AM: Built-in ferrite bar antenna

— Continued on page 2 —

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

COMPACT DISC/FM/AM STEREO CASSETTE-CORDER

SONY®

TC

Tape recorder section and general

Recording system	4-track 2-channel stereo
Fast winding time	Approx. 1 min. 50 sec. with Sony cassette C-60
Frequency response	DOLBY NR OFF • with TYPE IV cassette (Sony METAL-ES) 40–15,000 Hz • with TYPE I cassette (Sony HF-S) 40–14,000 Hz
Speakers	Two-way APM woofer: 77 cm², flat diaphragm Tweeter: 5 cm dia., cone type
Power output	4 W + 4 W at dc operation 5 W + 5 W (at 10% harmonic distortion) at ac operation
Inputs	One mixing microphone input jack (minijack) sensitivity 2.7 mV for low impedance microphone Two line input jacks (phono jack) sensitivity 0.44 V input impedance 47 kilohms
Outputs	Two line output jacks (phono jack) load impedance 10 kilohms or higher rated output 0.28 V (−8.2 dB) at load impedance 47 kilohms Two external speaker terminals for 4-ohm to 8-ohm impedance speaker Headphones jack (stereo minijack) for 8–300-ohm impedance headphones
Power requirements	The model for United Kingdom: 240 V ac, 50 Hz The model for European countries: 220 V ac, 50 Hz The model for other countries: 110, 120, 220 or 240 V ac adjustable, 50/60 Hz 12 V dc, 8 (size D) batteries, IEC designation R20 DC IN 12 V jack accepts: DCC-16AE car battery cord (optional) for use on 12 V car battery
Power consumption	The model for United Kingdom: 45 W The model for other countries: 40 W
Battery life	Approx. 7 hours (recording) Approx. 5.5 hours (playback) with Sony New Super batteries SUM-1 (NS) Approx. 12 hours (recording) Approx. 9 hours (playback) with Sony Eveready AM1 alkaline batteries
Dimensions	Approx. 556 × 203 × 196 mm (w/h/d) (22 × 8 × 7¾ inches) incl. projecting parts and controls with the carrying handle pushed down
Weight	Approx. 7.8 kg (17 lb 4 oz) incl. batteries

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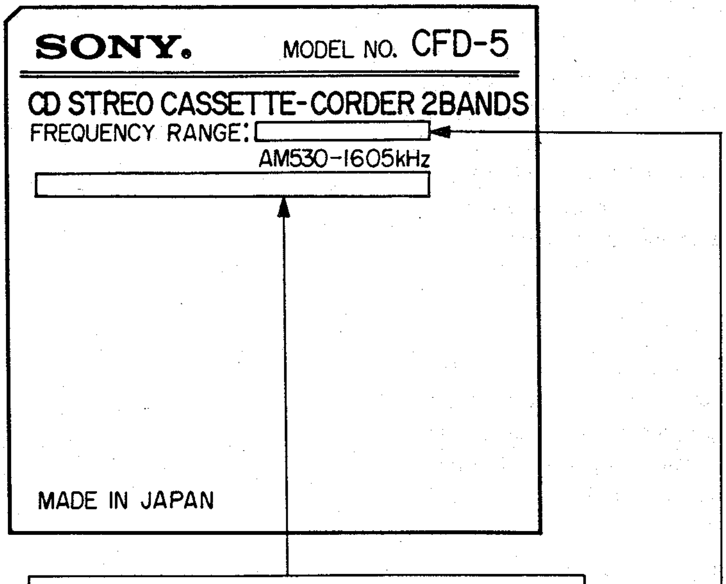
MODEL IDENTIFICATION

– Model Number Labels –



E model: AC: 110/120/220/240V ~ 50/60Hz 40W
US, Canadian model:. . . .AC: 120V 60Hz 32W
UK model: . . . . .AC: 240V ~ 50Hz 45W
AEP model: . . . . .AC: 220V ~ 50Hz 40W
FM 87.6 ~ 108MHz
G-AEP model: . . . . .AC: 220V ~ 50Hz 40W FM 87.6 ~ 107MHz

FEATURES

CD player section

High performance and fidelity
Flat frequency response (20–20,000 Hz), low wow and flutter (lower than the measurable limit), wide dynamic range (90 dB), minimal distortion (0.008%) and high channel separation (85 dB) are achieved. Listening to the sound reproduction of your CD player is just like being in the concert hall.

Full-logic "feather touch" operation
At the lightest touch, the "feather-touch" function keys enable you to switch directly from one mode to another.

AMS and SEARCH function
The AMS (Automatic Music Sensor) function for locating the beginning of a selection on the disc and the SEARCH function for locating the desired point in a particular selection.

Digital readout display
The track number and the playing time elapsed of the selection playing is shown on the LCD (Liquid Crystal Display) window. With one touch of the REMAIN key, this time display will change to indicate with a minus sign how many selections and how much playing time are left on the disc.

Non-contact signal readout system
Because a laser beam is employed for signal pick-up, there is no physical contact with the disc, which means no wear.
In addition, because the pit pattern is recorded below the surface of the disc, it is not necessary to be constantly on guard against dust, making the disc easy to handle.

Radio/cassette-corder section

Synchro dubbing function
With a press of a key, playback of a compact disc and recording on a cassette can be started.

Auto-reverse function
You can record on both sides of the cassette and repeat playback of both sides of the cassette continuously, without turning the cassette over.

Others
- Dolby noise reduction system reduces tape hiss noise.
- 5-band graphic equalizer controls facilitate fine tone adjustment.
- Tape select switch allows you to make optimum recording with standard tapes as well as high-performance metal tapes.
- Two-way speaker system provides dynamic sound.
- Timer switch is provided to turn the set on and off at times preset on an optional timer.

SAFETY CHECK-OUT (US Model)

After correcting the original service problem, perform the following safety check before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

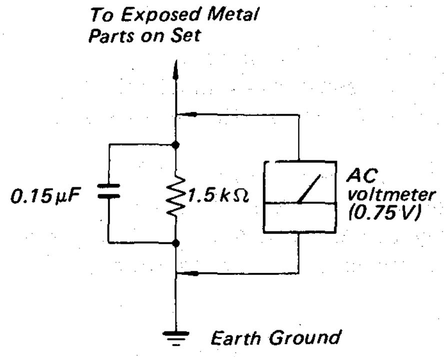


Fig. A. Using an AC voltmeter to check AC leakage.

SECTION 1

OUTLINE

1-1. PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

WARNING !!

DO NOT LOOK AT THE LASER BEAM.

1. Laser Diode Properties
   - Materiale: GaAlAs
   - Wavelength: 780 nm
   - Emission Duration: continuous
   - Laser Output: max. 0.4 mW*

     * This output is the value measured at a distance of about 1.6 mm from the objective lens surface on the Optical Pick-up Block.
   - Classification: Class IIIb
2. During service, do not take the Optical Pick-up Block apart, and do not adjust the APC circuit in the Optical Pick-up Block. If there is a breakdown in the APC circuit (including laser diode) in the Optical Pick-up Block, replace the entire Optical Pick-up Block (including APC board).

BESKYTTELSE AF ØJNE MOD LASERSTRÅLING UNDER SERVICE

I dette apparat anvendes laserlys. Derfor skal nedenstående instruktioner nøje følges under service.

ADVARSEL!!

Se ikke direkte på laserstrålen.

1. Laser-diode data
   - Materiale: GaAlAs
   - Bolgelængde: 780 nm
   - Udsendelsesvarighed: Kontinuerlig
   - Laseroutput: Max. 0,4 mW*

     * Dette output er værdien målt i en afstand af ca. 1,6 mm fra den optiske pick-up enheds linseoverflade.
   - Klassifikation: Klasse IIIb.
2. Adskil aldrig den optiske pick-up enhed under service, og juster ikke APC kredsløbet i den optiske pick-up enhed (Automatic Power Control). Hvis APC kredsløbet i den optiske pick-up enhed (inkl. laser-dioden) bryder ned, skal hele den optiske pick-up enhed udskiftes.

1-2. NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK (KSS-110A)

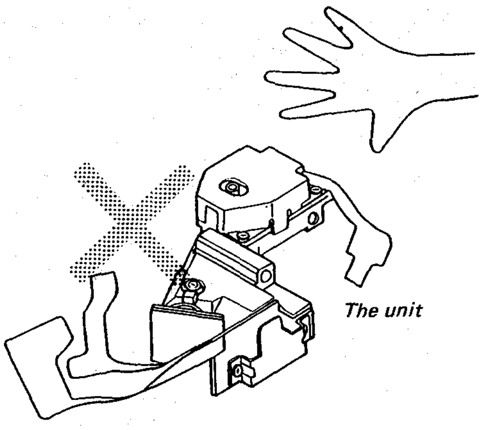
The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
The printed matter below is included in the repair parts. During repair, use the procedure in the printed matter.
The flexible board is easily damaged and should be handled with care.
The following method is an example for reference purposes:

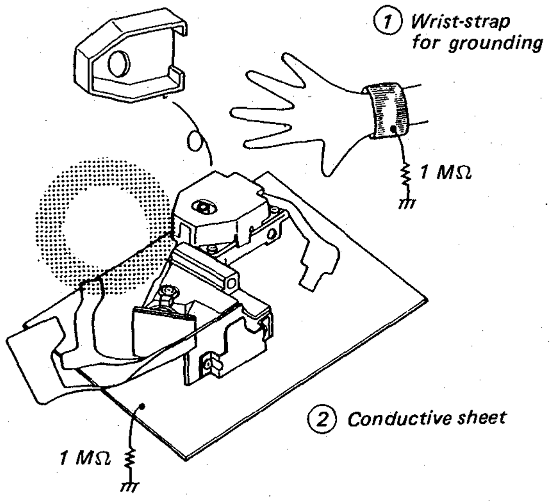
1. Place a conductive sheet on the workbench. (The black sheet used as repair parts wrapping).
2. Place the set on the conductive sheet so that the chassis touches the sheet. (This makes it the same potential as the conductive sheet).
3. Place your hands on the conductive sheet. (This makes them the same potential as the sheet).
4. Remove the optical pick-up block.
5. Perform work on top of the conductive sheet. Be careful that clothing does not touch the optical pick-up block.

Printed Matter Included in the Repair Parts

When opening or repairing the unit, the procedure for grounding as follows is required to prevent damage caused by static electricity.

1. Grounding for the human body
   Be sure to put on a wrist-strap for grounding (with impedance lower than 10^8 Ω) whose other end is grounded. The strap works to drain away the static electricity build-up on the human body.
2. Grounding for the work table
   Be sure to lay on the table a conductive sheet (with impedance lower than 10^9 Ω) such as sheet of copper, which is grounded.
3. As static electricity build-up on clothes is not drainded away, be careful not to let your clothes touch the unit.
4. Handling the flexible board
   The flexible board is easily damaged and should be handled with care.





1-3. Chip Component Indications

Chip Component Indications

The official specifications which are presently indicated are EIAJ standard.

(1) MELF (leadless): EIAJ RC-8001

(2) Square chip components (laminated ceramic): EIAJ RC-3699. Square chip resistors are presently under study by EIAJ.

The following explanation covers square chip components (MELF omitted).

1. 2-letter Method (EIAJ RC-3699)

- Letter combination: letter + 1 number
- Letter meaning: letter = effective numeric
  number = multiplier

* The units used are pF for capacitors and Ω (ohm) for resistor.

(This is mainly used for Symbol and Numeric and Multiplier capacitors.)

Letter	A	B	C	D	E	F	G	H	J	K	L
Numeric	1	1.1	1.2	1.3	1.5	1.6	1.8	2	2.2	2.4	2.7
Letter	M	N	P	Q	R	S	T	U	V	W	X
Numeric	3	3.3	3.6	3.9	4.3	4.7	5.1	5.6	6.2	6.8	7.5
Letter	Y	Z	a	b	d	e	f	m	n	t	y
Numeric	8.2	9.1	2.5	3.5	4	4.5	5	6	7	8	9

Number	0	1	2	3	4	5	6	7	8	9
Maltiplier	10^0	10^1	10^2	10^3	10^4	10^5	10^6	10^7	10^8	10^{-1}

- Ex.: A1 1×10^1 = 10 pF (or, 10Ω)
  E3 1.5×10^3 = 1500 pF (or, 1.5 kΩ)

2. 3-number Method

(Mainly used for chip resistors)

- Number meaning:

  1st and 2nd number = effective numeric
  3rd number = multiplier of 10

  Unit: pF for capacitor, for resistor

- Ex.: 103 10×10^3 = 10000Ω = 10 kΩ (or, 0.01 μF)
  224 22×10^4 = 220000Ω = 220 kΩ (or, 0.22 μF)

3. 4-letter Method (used for capacitor)

- Letter combination: 3 numbers + 1 letter
- Letter meaning: number = effective numeric + multiplier of 10
  (same as 3-number method)
  letter = capacitor response
- Symbol and Response

〈For temperature compensation〉

Symbol	C	P	R	S	T	U	(NO)
Response	CΔ	PΔ	RΔ	SΔ	TΔ	UΔ	SL

Δ is temperature coefficient tolerance, and is G, H, J, K.

〈For high dielectric constant〉

Symbol	K	Z
Response	B	F

- Ex.:

47
3Z ➡ 47×10^3 = 47000pF = 0.047μF F response

15
1R ➡ 15×10^1 = 150pF RΔ response

22
2 ➡ 22×10^2 = 2200pF SL response

1-4. Replacing chip components

All chip components should be connected and disconnected, using a tapered soldering iron [temperature of the iron tip: less than 280°C (536°F)], a pair of tweezers and braided wire.

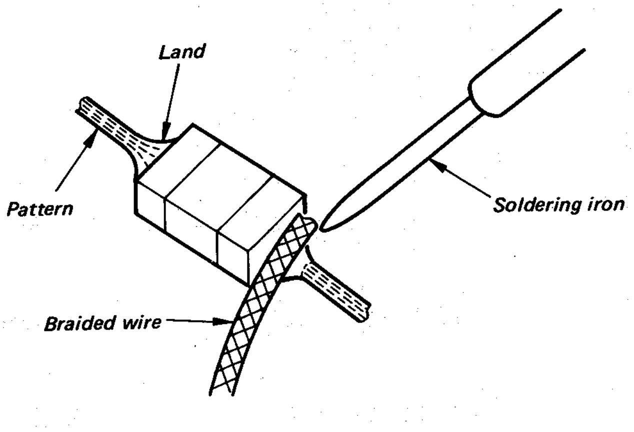
Precautions for replacement

1. **Do not disconnect the chip component forcefully. Otherwise, the pattern may peel off.**
2. **Never re-use a disconnected chip component. Dispose of all old chip components.**
3. **To protect the chip component, heating time for attaching the component should be within 3 seconds.**

○ Removing chip components

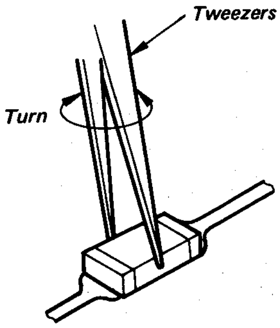
(1) Removing solder at electrode

Remove the solder at the electrode, using a thin braided wire. Do not remove the solder of the part (chip component) attached adjacent to the electrode.



(2) Disconnecting chip components

Turn the tweezers with the soldering iron alternately applied to both electrodes, and the chip component will be disconnected. Take careful precautions while disconnecting, because if the chip component is forcefully removed the land may peel off.
Never re-use a disconnected chip component.



(3) Smoothing the soldered surface

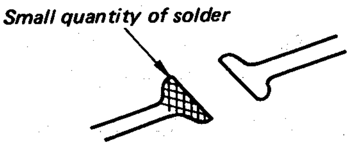
After disconnecting the chip component, remove the solder by using a braided wire to smooth the land surface.

○ Connecting chip components

The value of chip components is not displayed on the main body. Take due precautions to avoid mixing new chip components with other ones.

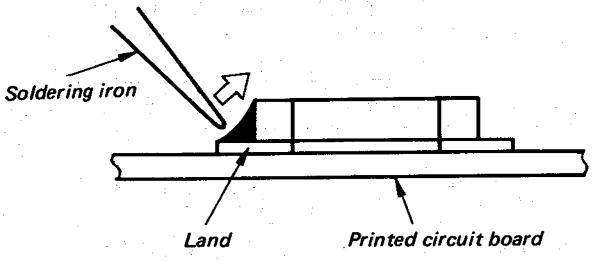
(1) Applying solder to land on one side

Apply a thin layer of solder to the land on one side where the chip component is to be connected. Too much solder may cause bridging.



(2) Speedy soldering

Hold the chip component at the desired position, using tweezers, and apply the soldering iron in the arrow-marked direction. To protect the chip component, heating time should be within 3 seconds.



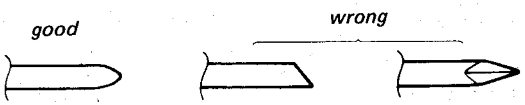
(3) Speedy soldering of electrode on the other side

Solder the electrode on the other side in the same way as in (2) above.

1-5. Flexible Circuit Board Repairing

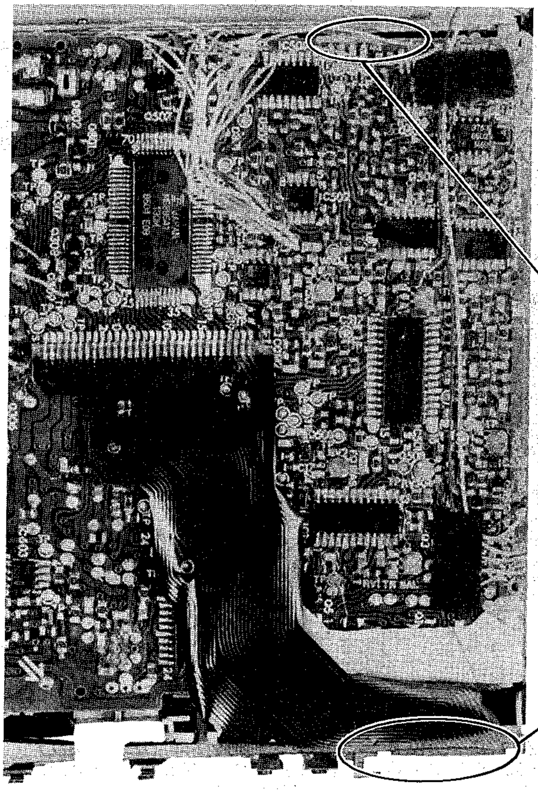
1. Keep the temperature of the soldering iron at 270° ± 10°C during repairing.
   You can maintain the temperature of the soldering iron around 270°C by using the thermal controller as illustrated on the right.
2. Do not touch the soldering iron more than 4 seconds or 3 times on the same conductor of the circuit board.
3. Do not apply force on the conductor when soldering or unsoldering.

Tip of soldering iron



1-6. NOTES ON OPENING MAIN BOARD OF CD SECTION

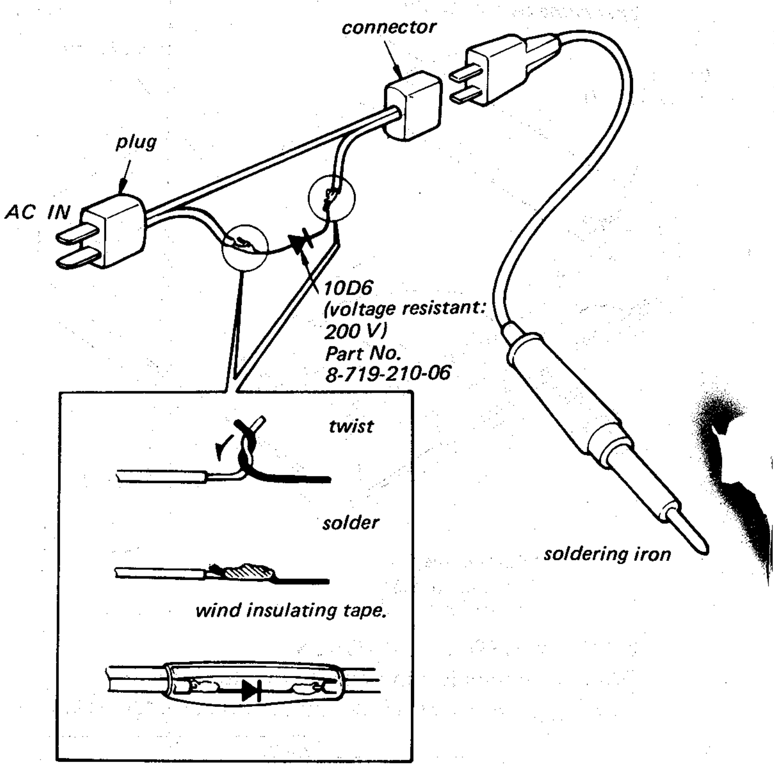
Be careful not to cut the FOP flexible boards when opening the main board during repair. If they break, FOP should be replaced.



Be careful not to break the flexible board which is attached to the end of this board.
(connected to FOP 2-axis device)

Be careful not to break the flexible board under this shield board.
(connected to FOP signal and laser)

To make thermal controller of soldering iron



1-7. CAUTION ON DC-DC CONVERTER REPLACEMENT

Be sure to check PLL free run frequency when replacing the DC-DC converter. (Refer to page 57) DC-DC converter –5V output voltage changes when the DC-DC converter is replaced, causing PLL free run frequency to change.

Reference:

Converter Output Voltage Variation

Conditions	Specifications
Input voltage DC +5 – 12 V	+5 V output: DC +5.2 V ± 50 mV –5 V output: DC–5.2 V ± 50 mV

1-8. CD SECTION
SERVICE MODE (service program) FOR CD SECTION

As shown in Figure 1, the program on this set selects either service program routine or normal routine after power supply is connected and a RESET signal enters. When it enters service program routine, the microcomputer brings the necessary job from each subroutine corresponding to the key input, and executes that job. Operation check can be performed efficiently using this mode. The operation method of service mode is explained below.

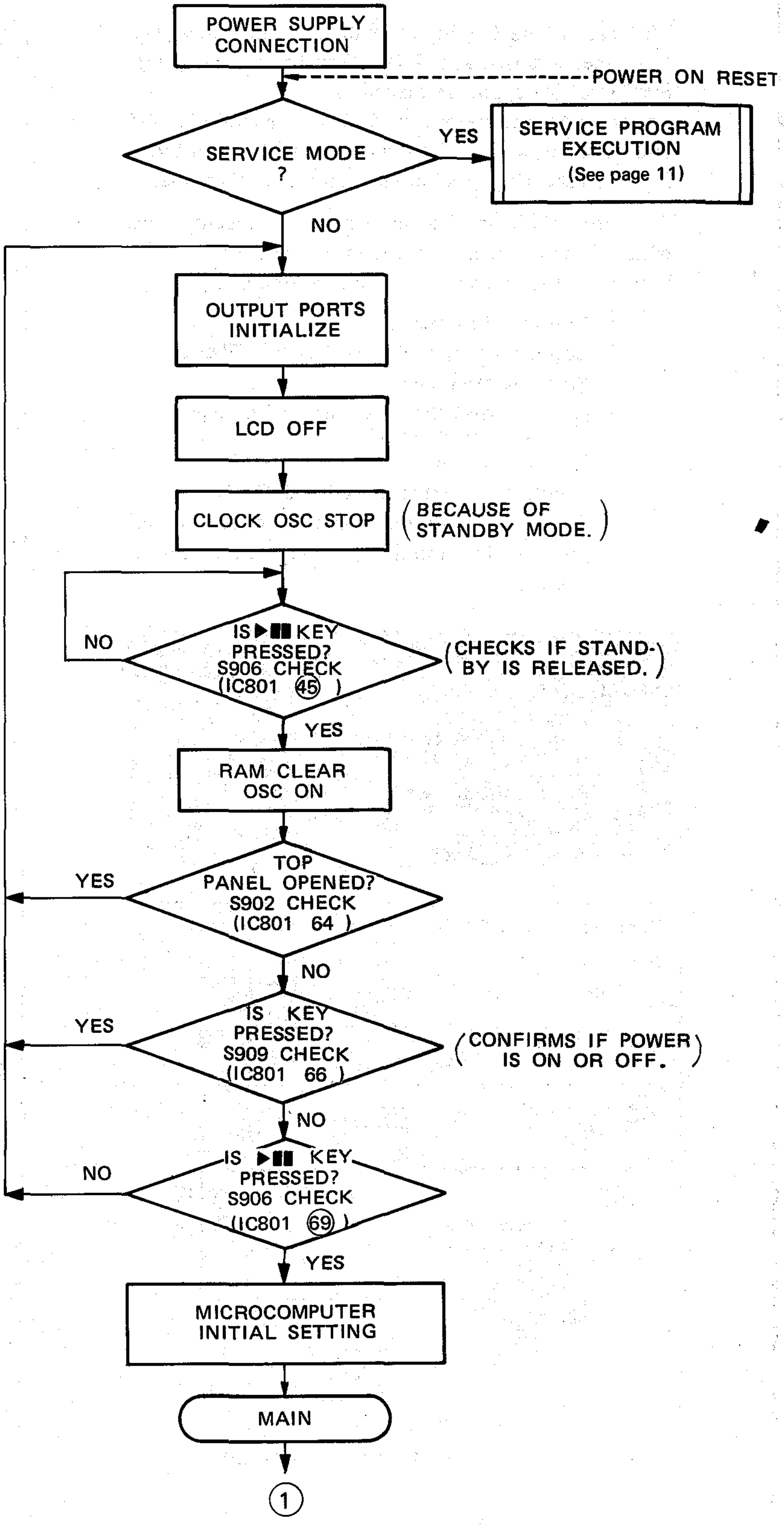
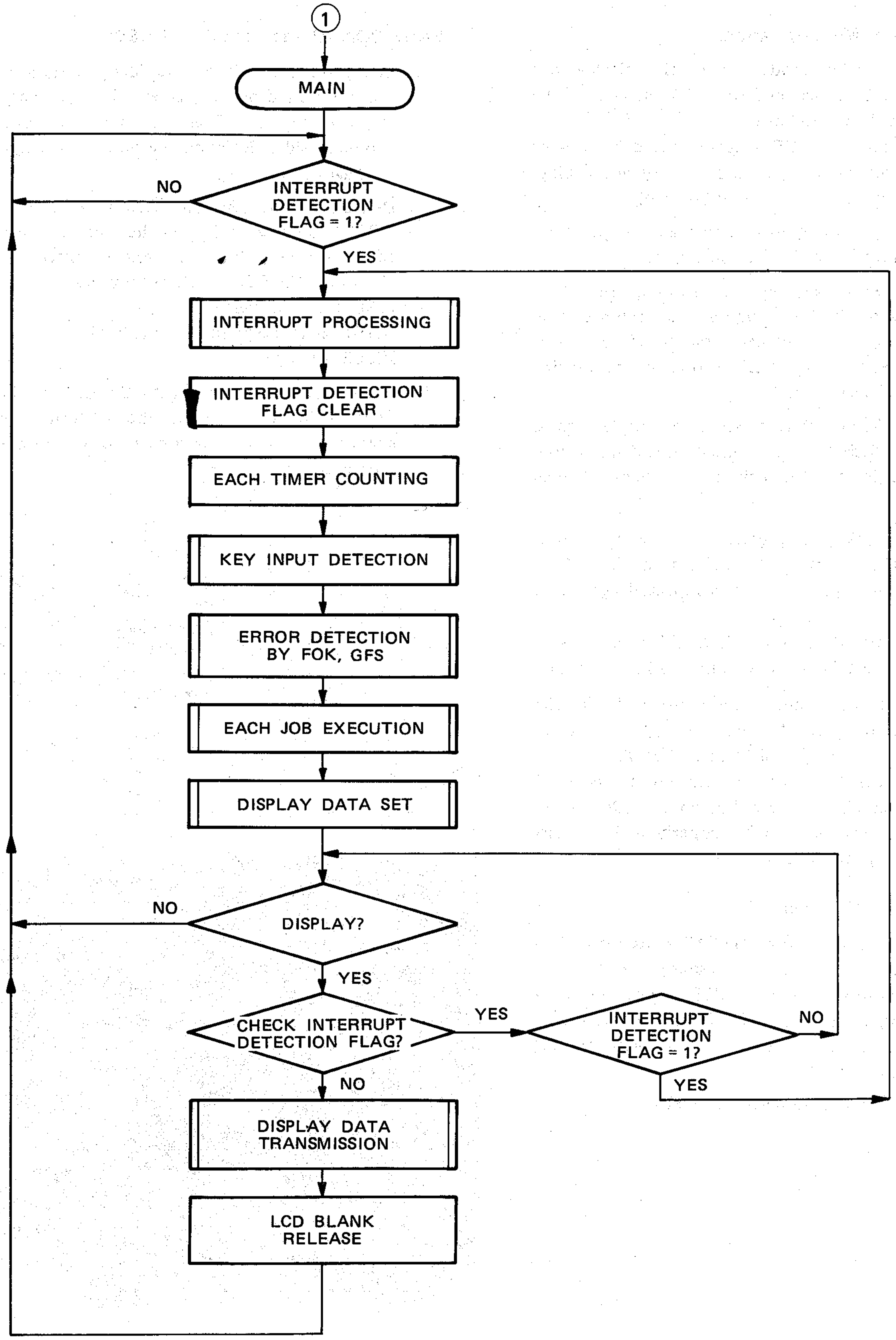

POWER SUPPLY CONNECTION
POWER ON RESET
SERVICE MODE ?
YES
SERVICE PROGRAM EXECUTION (See page 11)
NO
OUTPUT PORTS INITIALIZE
LCD OFF
CLOCK OSC STOP
(BECAUSE OF STANDBY MODE.)
NO
IS ▶■■ KEY PRESSED? S906 CHECK (IC801 ㊺)
(CHECKS IF STAND-BY IS RELEASED.)
YES
RAM CLEAR OSC ON
YES
TOP PANEL OPENED? S902 CHECK (IC801 64)
NO
YES
IS KEY PRESSED? S909 CHECK (IC801 66)
(CONFIRMS IF POWER IS ON OR OFF.)
NO
NO
IS ▶■■ KEY PRESSED? S906 CHECK (IC801 (69))
YES
MICROCOMPUTER INITIAL SETTING
MAIN
①

Figure 1. Progr


①
MAIN
INTERRUPT DETECTION FLAG = 1?
NO
YES
INTERRUPT PROCESSING
INTERRUPT DETECTION FLAG CLEAR
EACH TIMER COUNTING
KEY INPUT DETECTION
ERROR DETECTION BY FOK, GFS
EACH JOB EXECUTION
DISPLAY DATA SET
DISPLAY?
NO
YES
CHECK INTERRUPT DETECTION FLAG?
YES
NO
INTERRUPT DETECTION FLAG = 1?
NO
YES
DISPLAY DATA TRANSMISSION
LCD BLANK RELEASE

m Flow Chart

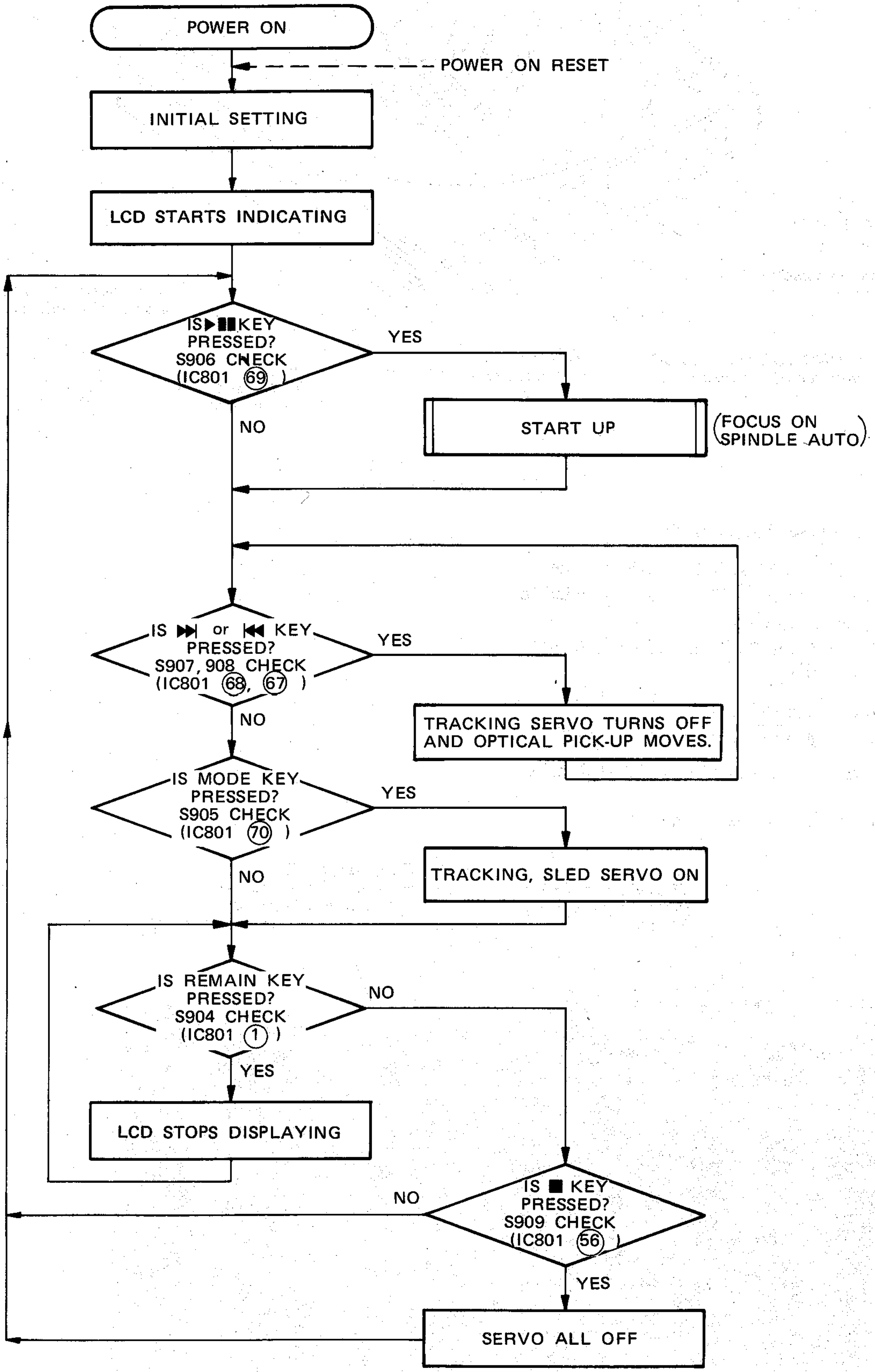

POWER ON
POWER ON RESET
INITIAL SETTING
LCD STARTS INDICATING
IS ▶❚❚ KEY PRESSED? S906 CHECK (IC801 ⑲)
YES
NO
START UP
(FOCUS ON SPINDLE AUTO)
IS ▶▶❚ or ❚◀◀ KEY PRESSED? S907, 908 CHECK (IC801 ⑱, ⑰)
YES
NO
TRACKING SERVO TURNS OFF AND OPTICAL PICK-UP MOVES.
IS MODE KEY PRESSED? S905 CHECK (IC801 ⑳)
YES
NO
TRACKING, SLED SERVO ON
IS REMAIN KEY PRESSED? S904 CHECK (IC801 ①)
NO
YES
LCD STOPS DISPLAYING
IS ■ KEY PRESSED? S909 CHECK (IC801 (56))
NO
YES
SERVO ALL OFF

Fig. 1-1 Service Program Flow Chart

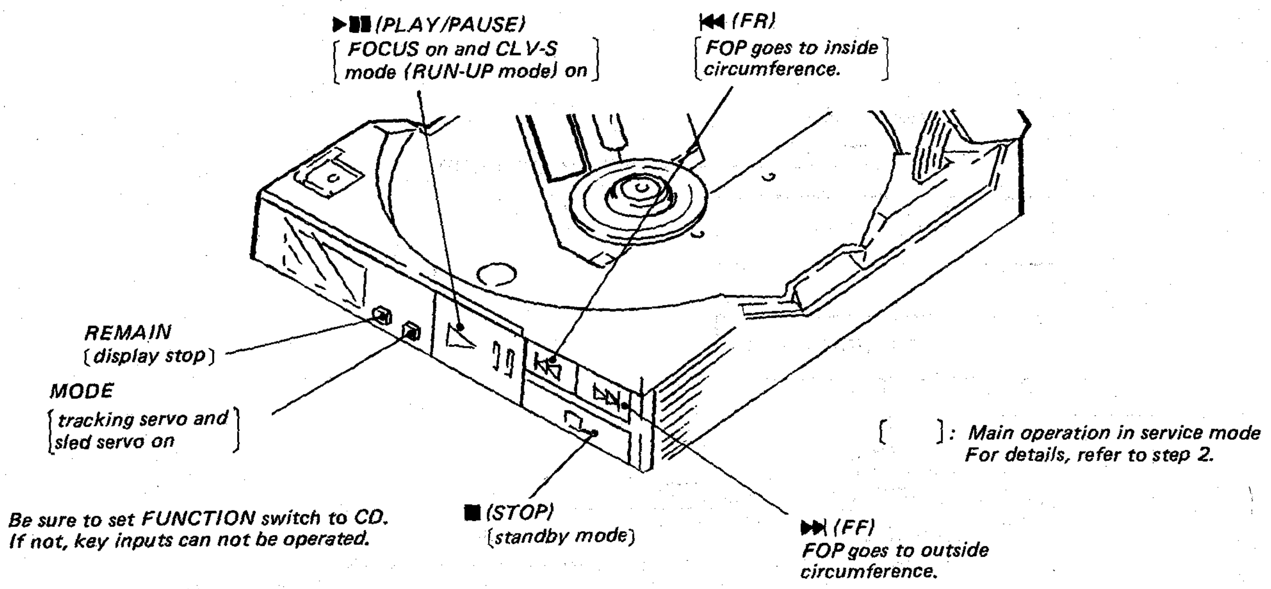

▶❚❚ (PLAY/PAUSE)
[FOCUS on and CLV-S mode (RUN-UP mode) on]
⏮ (FR)
[FOP goes to inside circumference.]
REMAIN
[display stop]
MODE
[tracking servo and sled servo on]
[ ] : Main operation in service mode
For details, refer to step 2.
Be sure to set FUNCTION switch to CD.
If not, key inputs can not be operated.
■ (STOP)
[standby mode]
⏭ (FF)
FOP goes to outside circumference.

Fig. 2 Key Positions

Step 1 (Service Mode setting method)

1. Turn the FUNCTION switch to CD with the POWER switch turned off (no power applied to set) and press the ▶❚❚ key.
   (This is to discharge C803 connected to IC801 pin ⑧ ($\overline{\text{PRESET}}$).)
2. Solder jumper BATT2 point.
   (IC801 pin (51) ($\overline{\text{BATT-E}}$) pin is grounded.)
3. Put batteries in the set and turn POWER switch ON.
   This puts the set into service mode.

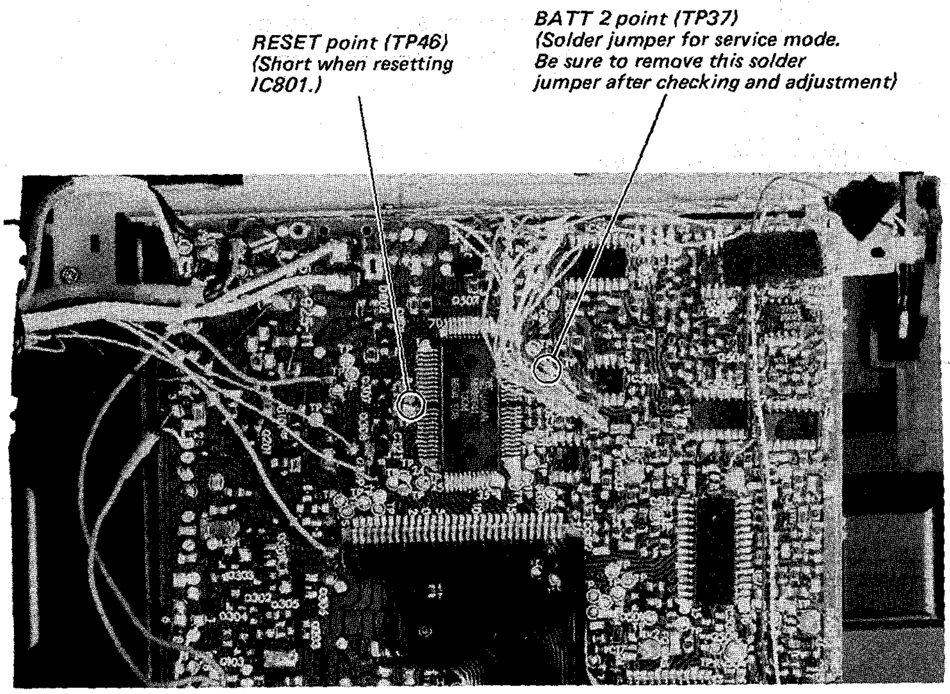

RESET point (TP46)
(Short when resetting IC801.)
BATT 2 point (TP37)
(Solder jumper for service mode.
Be sure to remove this solder jumper after checking and adjustment)

Fig. 3 BATT2 point, RESET point Positions

Step 2 (Service Mode operation)

1. When service mode is set, the display will change 16 times, and those 16 changes will be repeated over and over.
   With this the LCD display should be present in service mode. Even if LCD does not display, other operations will be performed.
2. When ■ key is pressed during each operation, it will return to the state in step 1.
3. When ▶▶| or |◀◀ key is pressed, the FOP moves to the inside or outside circumference. Tracking servo and sled servo go off when this is done, so press MODE to turn on the tracking servo if necessary.
4. When REMAIN is pressed, the display stops. When REMAIN is released, the display continues to change. This allows check of each segment.
5. When ▶❚❚ key is pressed, focus search starts, then CLV-S (run-up mode) starts. When there is no disc, focus search is repeated again and again.
6. When MODE is pressed, tracking servo, sled servo and CLV-A (servo during PLAY) go ON.
7. When steps 5 and 6 are performed, the disc begins to play. At this time, the top panel should be closed and S901 and S902 are to be ON. When the laser is not emitted, focus search is repeated. When S901 is on and S902 is off, CLV-S does not work properly and the disc rotates at high speed.

Step 3 (Service Mode release)

1. First be sure to turn POWER switch off, then remove the BATT2 point solder jummper.
   During service mode, C803 is discharged by turning POWER switch off. Therefore, microcomputer IC801 is reset by next turning POWER switch on.
2. The set will now operate normally.

MAIN BOARD (double-sided) CHECK

1. The main board is double-sided, so there are parts mounted on both sides. However, checking can be done from the chip component mounted side. Refer to the mounting diagram on Pages 72–76.
2. D/A coverter IC's are mounted underneath the DC-DC converter unit, and these can be checked from the chip component mounted side.
   IC's under the DC-DC converter unit:
   IC301: D/A converter
   IC101, 201: integrator, sample hold
   IC302: switcher
3. When operating the set with the LCD module flexible board removed, the pattern corresponding to each key switch is to be grounded momentarily.

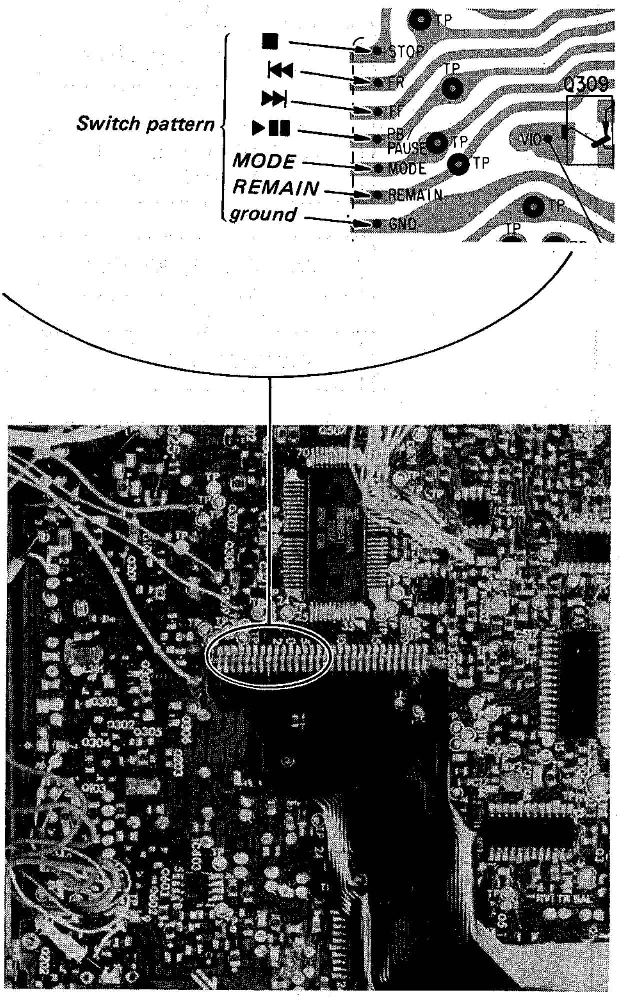


Fig. 4 Switch Pattern Diagram

Laser Diode Check Procedure

The laser diode in this set will not emit unless the top panel is closed and S901 (terminal sorting type), S902 (leaf SW type) are turned on.
Focus search can be operated in service mode even if S902 is OFF, so that the laser diode will emit if S901 (terminal shorting type) are turned on in this mode.

The laser diode is checked using the current value which flows to the laser diode inside the FOP.
Procedure 1 (service mode or normal operation).

1. Close the top panel.
2. Connect an ammeter as shown in Figure 5.
3. Press the ▶❚❚ key.
4. Confirm that the ammeter reading is within the range given below.
   10–100 mA
   If not, APC circuit or FOP is defective.
   If normal operation is used, the laser diode goes on for about 3 seconds due to focus search.

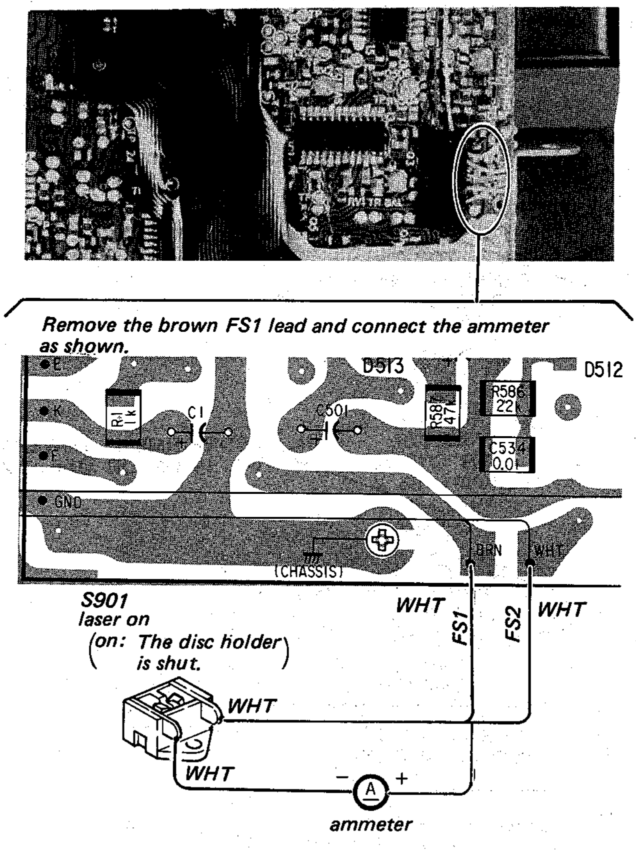
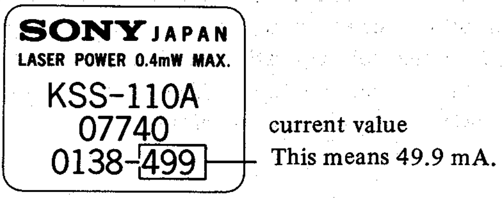

Remove the brown FS1 lead and connect the ammeter as shown.

Fig. 5 Ammeter Connection

Procedure 2 (service mode or normal operation).

1. Close the top panel.
2. Remove the main board and read the current value on the label affixed to the FOP.
   (Label on FOP)

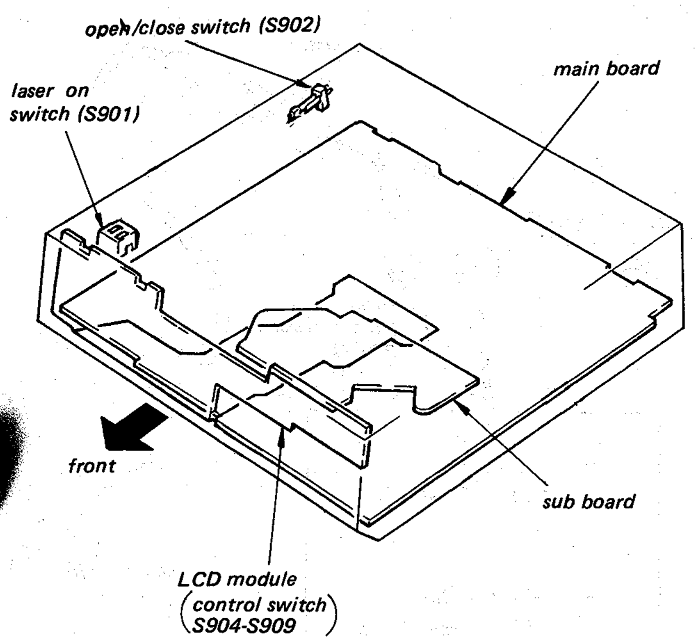

SONY JAPAN
LASER POWER 0.4mW MAX.
KSS-110A
07740
0138-499

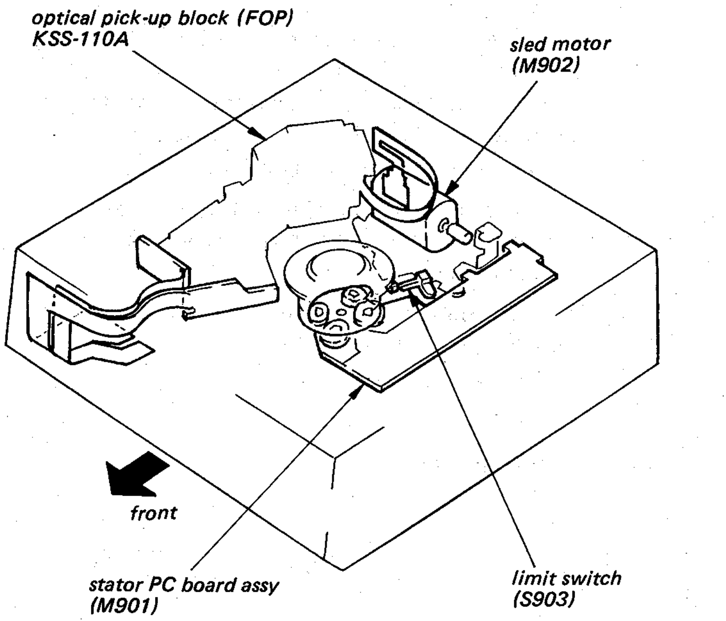
current value
This means 49.9 mA.

The current value varies with the set.

3. Mount the main board and connect an ammeter as shown in Figure 5.
4. Press the ▶❚❚ key.
5. Confirm that the ammeter reading is within the range given below.
   value on label $^{+11}_{-5}$ mA (25°C)
   variation relative to temperature:
   0.4 mA/°C
   (Current increases when temperature rises and decreases when it drops.)
   If the value is more than the range given, APC circuit has been defective or the laser diode is deteriorated. If it is less, APC circuit or FOP is defective.

PC BOARDS/SWITCH/MOTOR LAYOUTS

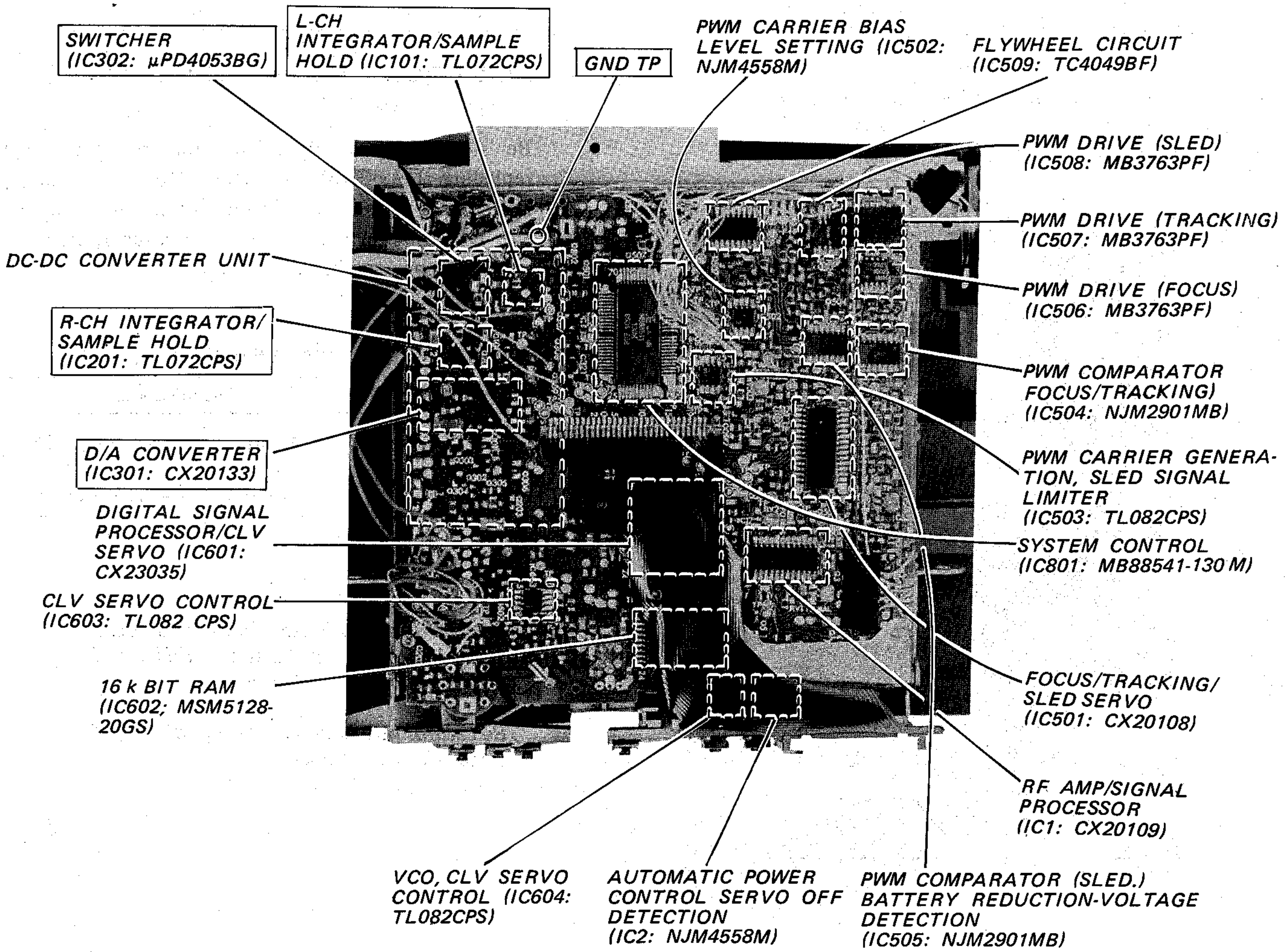

open/close switch (S902)
laser on switch (S901)
main board
front
sub board
LCD module (control switch S904-S909)


optical pick-up block (FOP) KSS-110A
sled motor (M902)
front
stator PC board assy (M901)
limit switch (S903)

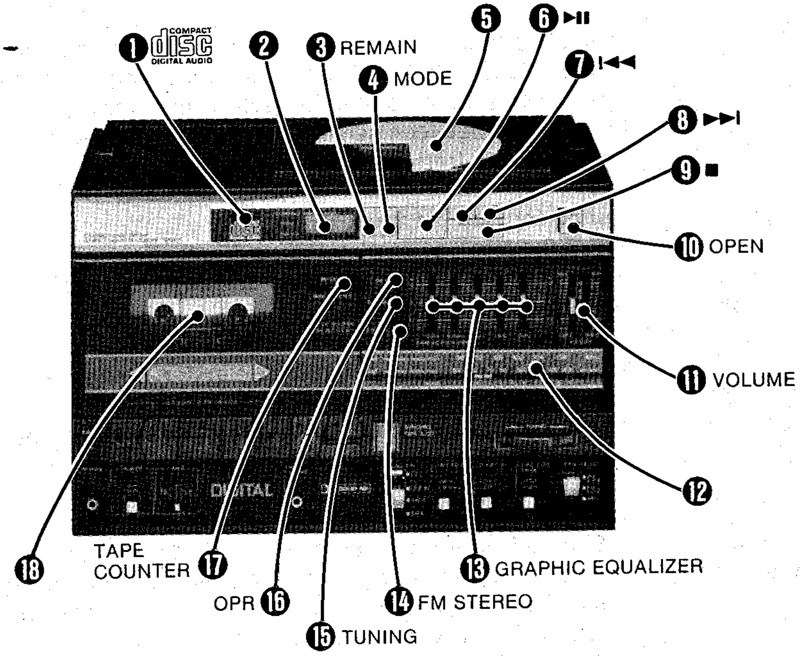
MAIN BOARD IC LAYOUTS

(Viewed from chip component mounted side)

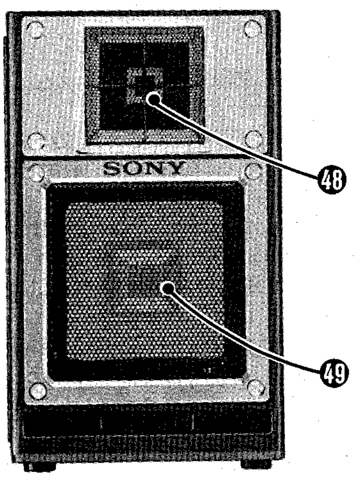
Parts in ☐ are mounted under DC-DC CONVERTER UNIT.

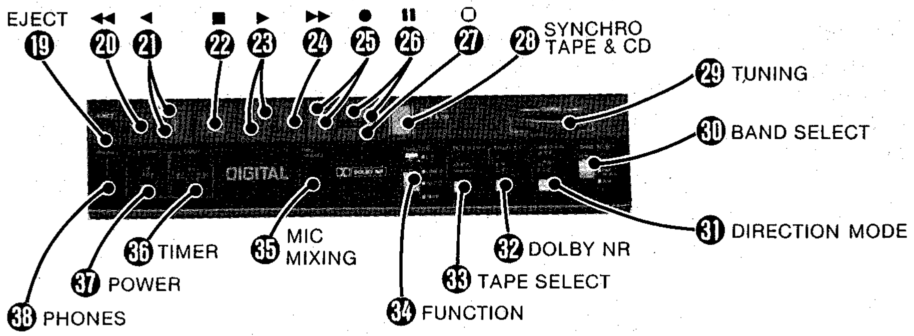

SWITCHER (IC302: μPD4053BG)
L-CH INTEGRATOR/SAMPLE HOLD (IC101: TL072CPS)
GND TP
PWM CARRIER BIAS LEVEL SETTING (IC502: NJM4558M)
FLYWHEEL CIRCUIT (IC509: TC4049BF)
PWM DRIVE (SLED) (IC508: MB3763PF)
PWM DRIVE (TRACKING) (IC507: MB3763PF)
DC-DC CONVERTER UNIT
PWM DRIVE (FOCUS) (IC506: MB3763PF)
R-CH INTEGRATOR/SAMPLE HOLD (IC201: TL072CPS)
PWM COMPARATOR FOCUS/TRACKING) (IC504: NJM2901MB)
D/A CONVERTER (IC301: CX20133)
PWM CARRIER GENERATION, SLED SIGNAL LIMITER (IC503: TL082CPS)
DIGITAL SIGNAL PROCESSOR/CLV SERVO (IC601: CX23035)
SYSTEM CONTROL (IC801: MB88541-130 M)
CLV SERVO CONTROL (IC603: TL082 CPS)
16 k BIT RAM (IC602; MSM5128-20GS)
FOCUS/TRACKING/ SLED SERVO (IC501: CX20108)
RF AMP/SIGNAL PROCESSOR (IC1: CX20109)
VCO, CLV SERVO CONTROL (IC604: TL082CPS)
AUTOMATIC POWER CONTROL SERVO OFF DETECTION (IC2: NJM4558M)
PWM COMPARATOR (SLED.) BATTERY REDUCTION-VOLTAGE DETECTION (IC505: NJM2901MB)

1-9. FUNCTIONS OF CONTROLS AND SWITCHES

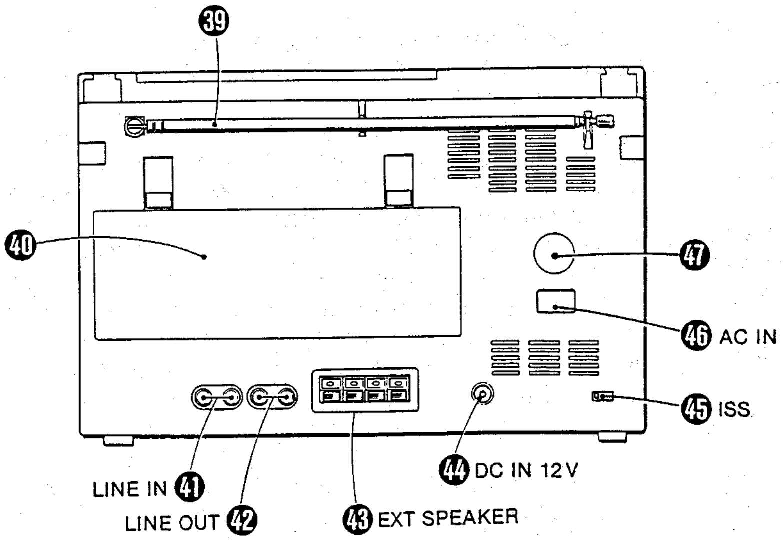

① COMPACT disc DIGITAL AUDIO
②
③ REMAIN
④ MODE
⑤
⑥ ►II
⑦ I◄◄
⑧ ►►I
⑨ ■
⑩ OPEN
⑪ VOLUME
⑫
⑬ GRAPHIC EQUALIZER
⑭ FM STEREO
⑮ TUNING
OPR ⑯
TAPE COUNTER ⑰
⑱
DIGITAL

Speaker

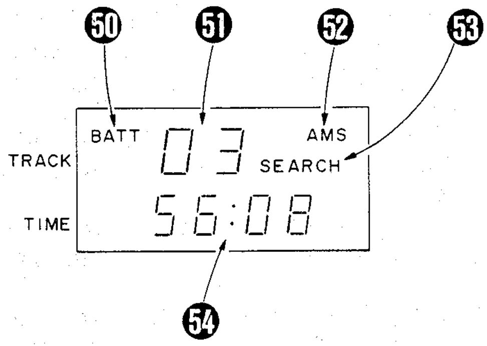



EJECT ⑲
◄◄ ⑳
◄ ㉑
■ ㉒
► ㉓
►► ㉔
● ㉕
II ㉖
○ ㉗
㉘ SYNCHRO TAPE & CD
㉙ TUNING
㉚ BAND SELECT
㉛ DIRECTION MODE
㉜ DOLBY NR
㉝ TAPE SELECT
㉞ FUNCTION
㉟ MIC MIXING
㊱ TIMER
㊲ POWER
㊳ PHONES
DIGITAL

Rear


㊴
㊵
LINE IN ㊶
LINE OUT ㊷
㊸ EXT SPEAKER
㊹ DC IN 12V
㊺ ISS
㊻ AC IN
㊼

Display window ❷


㊿
(51)
(52)
(53)
BATT
AMS
TRACK
03
SEARCH
TIME
56:08
(54)

FUNCTION OF CONTROLS

The numbers in the photos [A] on page 3 are keyed to the following explanations.

Front

❶ **COMPACT disc DIGITAL AUDIO indicator**
Lights up when the FUNCTION switch is set to CD.

❷ **Display window**
See ㊿–(54) on page 19 and the illustration on page 17.

❸ **REMAIN key**
While this key is being pressed, the TRACK indicator will show the remaining number of selections on the disc and the TIME counter will show the time remaining before the end of the last selection.
When you stop pressing the key, the display will return to the normal indications. (See page 21.)

❹ **MODE key**
Press to select either AMS function or SEARCH function. When play starts, the AMS indicator will appear on the dispaly window, indicating that the AMS function can be activated by pressing the ◀◀ or ▶▶ key.
To select the SEARCH function, press this key.
The SEARCH indicator will appear. Press the key again to return to the AMS function.

❺ **Disc compartment**
Place a compact disc here. To open the lid, press the OPEN button.

❻ **▶II (play/pause) key**
Press this key once to start disc playing. The indications on the display window will appear.
Press again to stop the play for a moment. The TIME counter will flicker. To release the pause mode, press this key again. The TIME counter will return to the normal time indication and disc playing restarts.

❼ **I◀◀ (AMS/search) key**
While the AMS indicator is being displayed, press to go back to the beginning of the desired selection. While the SEARCH indicator is being displayed, keep the key pressed to go back to the desired point in a particular selection. During pause mode, you can go back faster than during playback.

❽ **▶▶I (AMS/search) key**
While the AMS indicator is being displayed, press to advance to the beginning of the desired selection. While the SEARCH indicator is being displayed, keep the key pressed to advance to the desired point in a particular selection. During pause mode, you can advance faster than during playback.

❾ **■ (stop) key**
Press to stop the disc playing. The indications on the display window will disappear after a few seconds and disc will stop rotating.

❿ **OPEN button**
Press to open the disc compartment lid.

⓫ **VOLUME controls**
These control the overall output level.

⓬ **Frequency scale and dial pointer**

⓭ **GRAPHIC EQUALIZER controls**
Slide downwards or upwards to equalize the reproduced sound.
When the equalizer is not used, set the controls to 0 (center position).

Frequency coverage of each equalizer control
100 Hz: Use this control to boost or cut the bass.
400 Hz: Use this control to adjust the middle frequency range such as the human voice and the middle frequencies of instrumental music.
1 kHz: Use this control to provide more presence of vocals.
4 kHz: Use this control to adjust the brightness of sound.
10 kHz: This control effects general treble. Slide downward to reduce high frequency noise, such as tape hiss.

⓮ **FM STEREO indicator**
This indicator will light when an FM stereo program of sufficient signal strength is tuned in.

⓯ **TUNING indicator**
Lights up when a signal is tuned in accurately.

⓰ **OPR (operation) indicator**
This indicator lights up while the unit is in operation.

⓱ **TAPE COUNTER and reset button**

⓲ **Cassette holder**

⓳ **EJECT lever**
Press this lever to open the cassette holder.

⓴ **◀◀ (fast-reverse, rewind) key**

㉑ **◀ REV (reverse) key and indicator**

㉒ **■ (stop) key**

㉓ **▶ FWD (forward key and indicator**

㉔ **▶▶ (fast-forward) key**

㉕ **● (record) key and indicator**

㉖ **II (pause) key and indicator**

㉗ **○ REC MUTE (record muting) key**

㉘ **SYNCHRO TAPE & CD key**
Press this key to start the recording from the builtin CD player.

㉙ **TUNING knob**

㉚ **BAND SELECT switch**
FM ST: Normally set to this position for FM reception.
FM MONO: Set to this position when it is hear to hear the FM broadcast due to noise.
AM: For AM reception.

㉛ **DIRECTION MODE switch**
Depress the switch (⊒ ○) to record on both sides of a cassette or to repeat playback of both sides of a cassette. The recording will stop at the end of the reverse side. So if the switch is depressed when the reverse side of the cassette is being recorded, the tape will stop at the end of that side.
Press to release it (⊓ ⇌) to record or play back the front side or the reverse side of a cassette once only.

㉜ **DOLBY NR switch**
To record with the Dolby NR* (Noise Reduction) process, depress the switch (⊒ ON). To record without the Dolby NR process, press it again (⊓ OFF).
When playing back, set this switch to the same position used in recording.

*"Dolby" and the double-D symbol are trade marks of the Dolby Laboratories Licensing Corporation. Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.

㉝ **TAPE SELECT switch**
Select the type of tape to be used.
Depress the switch (⊒METAL) for a TYPE IV (metal) tape or TYPE II (CrO$_2$) tape.
Press to release it (⊓ NORMAL) for a TYPE I (normal) tape.

㉞ **FUNCTION selector**
CD: To listen to or record the CD sound.
LINE IN: To listen to or record the sound of the equipment connected to the LINE IN jacks.
RADIO: To listen to or record radio programs.
TAPE: To play back the tape.

㉟ **MIC MIXING (microphone mixing) jack (minijack)**
For connecting a microphone for mixing. See "Microphone mixing" on page 23.

㊱ **TIMER switch**
You can set the unit to record or playback mode at a predetermined time by connecting any commercially available timer. See "Examples of timer use" on page 24.

㊲ **POWER switch**

㊳ **PHONES (headphones) jack (stereo minijack)**
Accepts any headphones with a stereo miniplug. When the headphones are plugged in, the speakers are automatically disconnected.

Rear panel

㊴ **Telescopic antenna**
Used for FM reception.

㊵ **Battery compartment**

㊶ **LINE IN (line input) jacks (phono jacks)**
For connecting an additional cassette deck to dub a tape or for connecting an amplifier to record the sound through the amplifier onto this set.

㊷ **LINE OUT (line output) jacks (phono jacks)**
For connecting an additional cassette deck to dub a tape from this set or to record the mixed sound of the microphone and the built-in cassette deck.

㊸ **EXT SPEAKER (external speaker) terminals**
Connect the speaker system using the supplied speaker cords.

㊹ **DC IN (external power input) 12 V jack**
For connecting an optional Sony car battery cord DCC-16AE.

㊺ **ISS (interference suppress switch)**
While recording AM programs, if a beat (whistling noise) is heard, which does not occur before pressing the ● button, set the ISS at the rear to 1, 2 or 3, depending on which best reduces the noise.

㊻ **AC IN (power input) jack**
For connecting the supplied ac power cord.

㊼ **Voltage selector (for the model except for United Kingdom and European countries)**
As required, set the selector to either 110, 120, 220 or 240 V.

Speaker

㊽ **Tweeter**

㊾ **Woofer**

Display window ❷

㊿ **BATT (battery) indicator**
This indicator appears when disc playing starts. During battery operation, this indicator shows the battery condition. When the batteries are weak, the indicator flickers.

(51) **TRACK indicator**
This indicator shows the track number of the selection being played.
While the REMAIN key is being pressed, the indicator shows the remaining number of selections on the disc.

(52) **AMS indicator**
This indicator appears when disc playing starts. While this indicator is being displayed, you can locate the beginning of the desired selection by pressing either the ◀◀ or ▶▶ key.

(53) **SEARCH indicator**
This indicator appears when the MODE key is pressed once during the playback or the pause mode. While this indicator is being displayed, if you press either ◀◀ or ▶▶ key, you can go back or advance to the desired point on the disc.

(54) **TIME counter**
The counter shows the location in a particular selection by means of actual elapsed time. The first two digits of the counter show playing time of the selection in minutes, and the last two digits show the seconds.
While the REMAIN key is being pressed, the counter shows the time remaining before the end of the last selection on the disc. During pause, the time indication flickers.

MICROPHONE MIXING

- No recording level adjustment is necessary with the automatic recording system.
- The recording level is not affected by the VOLUME or GRAPHIC EQUALIZER controls.
- The use of TYPE I (normal) and TYPE IV (metal) tapes is recommended for recording.

Note
When recording on both sides of the cassette, be sure to start recording from the front side. If the recording is started from the reverse side, the tape stops at the end of the reverse side even if the DIRECTION MODE switch is depressed (▭ ⟲).

All-mode shut-off mechanism
When a tape is entirely wound in any operating mode (except for playback with the DIRECTION MODE switch set to ▭ ⟲), the engaged mode will be shut off automatically and the indicators will go off.

Quick reverse
When the DIRECTION MODE switch is depressed (▭ ⟲), as soon as the playback or recording of the front side of the cassette is finished, the playback or recording of the other side will begin.

RECORD MUTING OPERATION

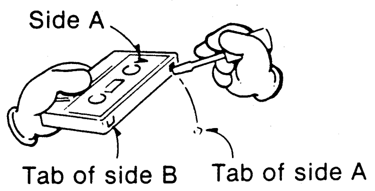
While recording, you can eliminate unwanted program material such as commercials by using the ○ (record muting) key.
While this key is pressed, no signals are recorded on the tape, but you can monitor the program through the speakers or headphones.

1. While recording, just before the portion to be eliminated, press the ○ key. Hold it pressed for about four or five seconds.
2. Press the ❚❚ key and release the ○ key.
3. When you want to start recording again, press the ❚❚ key to release. Now the recording will beging again.

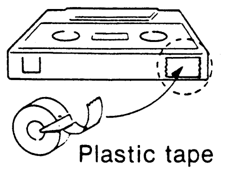
NOTES ON CASSETTES

To prevent accidental erasure
Remove the tab as illustrated so that the record mode does not function when the record key is pressed. To record on a cassette once tabs have been removed, simply cover the slot with plastic tape.

To protect side A recording



Do not stick any material on the cassette except for tape on the circled protions.



1. Set the VOLUME controls to MIN.
2. Connect the microphone equipped with a miniplug to the MIC MIXING jack.
3. Depress the POWER switch (▭ ON).
4. Select the sound source which you want to mix with the microphone with the FUNCTION selector.
   For the CD sound, set it to CD.
   For the program source connected to the LINE IN jacks, set it to LINE IN.
   For a radio program, set it to RADIO.
   For a taped sound, set it to TAPE.
5. Play the program source to be mixed.
6. Adjust the volume and tone with the VOLUME and GRAPHIC EQUALIZER controls.

When mixing with the built-in CD player, the microphone sound cannot be heard through the equipment connected to the LINE OUT jack.

Recording the mixed sound
To record the mixed sound of the microphone and the tuner or CD player etc., set the CFD-5 in record mode.
To record the mixed sound of the microphone and the built-in cassette deck, connect an additional cassette deck to the LINE OUT jacks and set the CFD-5 in playback mode. Set the other equipment in the record mode.

Note
A howling sound may occur when the microphone is too near the speakers. If this happens, move the microphone away from the speakers or turn down the VOLUME controls.

LISTENING TO/RECORDING FROM VARIOUS SOUND SOURCES

Notes on connection
For connection, see the illustrations F — H on page 5.

- Before connecting, be sure to turn the power off.
- Be sure to insert the plugs firmly into the jacks. Loose connections may cause hum and noise.
- Use the optional Sony RK-74A connecting cord.

Dubbing from another stereo tape recorder (illus. F)

1. Depress the POWER switch (▭ ON).
2. Set the FUNCTION selector to LINE IN.
3. Set the TAPE SELECT switch and DOLBY NR switch appropriately.
4. Set CFD-5 in record mode.
5. Set the other recorder in playback mode.

Recording the CD sound onto another stereo tape recorder (illus. G)

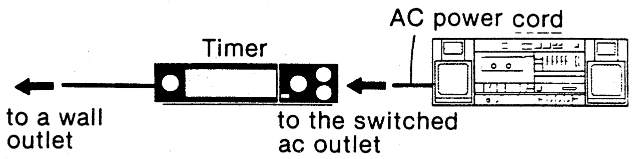
1. Depress the POWER switch (▭ ON).
2. Set the FUNCTION switch to CD.
3. Set the other tape recorder in record mode and play a disc.

Listening to the CD sound through an amplifier (illus. H)

1. Depress the POWER switch (▭ ON).
2. Set the FUNCTION switch to CD.
3. Start the disc playing.

Caution
Do not connect the LINE OUT jacks to the PHONO inputs of the amplifier.

EXAMPLES OF TIMER USE



Example ⓐ Timer activated recording

1. Set the TIMER switch to OFF.
2. Set the power switches of the CFD-5 and the timer to ON.
3. Set the FUNCTION selector to RADIO and tune in the station which will broadcast the program you want to record.
4. Insert a cassette with the side to be recorded on toward you, and set the TAPE SELECT and DOLBY NR switches appropriately.
5. Set the DIRECTION MODE switch as desired.
   To play back the front side only, set it to ⊐⇄ .
   To repeat playback of both sides, set it to ▭ ⟲ .
6. Set the timer to the desired time. (At this point, power to the set will be cut off.)
7. Set the TIMER switch of the CFD-5 to REC.

Note on timer-activated recording on both sides
Timer-activated recording or playback always begins from the front side when the power is turned on. Therefore, if power is interrupted during reverse side recording, or if a program timer which can turn multiple programs on and off in sequence is used and the recording by the previous timer setting has finished on the reverse side, the next recording will start from the front side and the recorded material on the front side will be erased.

Example ⓑ To wake up to the CD sound, a taped program or a radio program

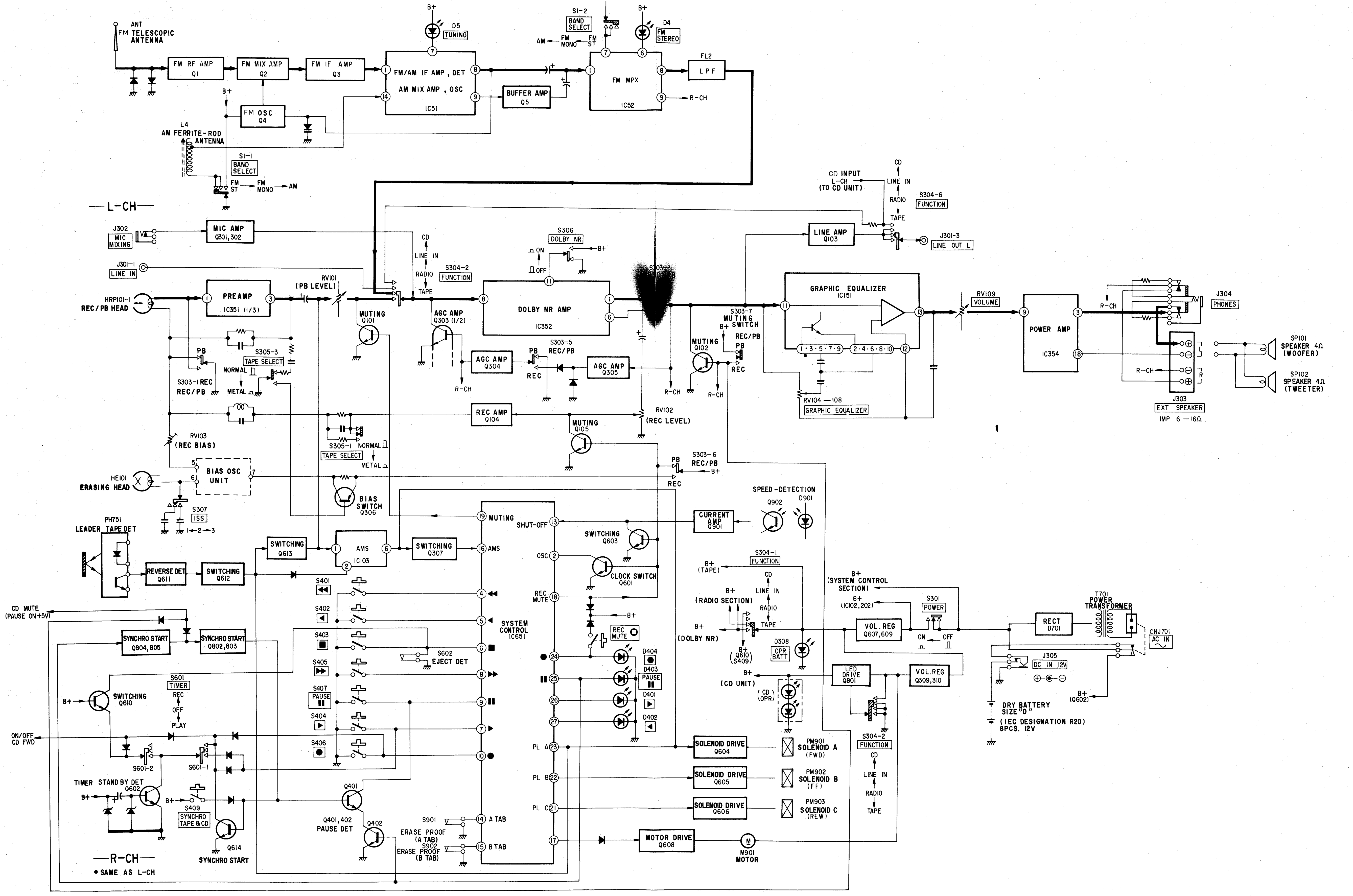
1. Set the TIMER switch to OFF.
2. Set the power switches of the CFD-5 and the timer to ON.
3. Select the sound source to which you want to wake up using the FUNCTION selector and play the program source.
4. Adjust the volume with the VOLUME controls.
5. Set the timer to the desired time. (At this point, power to the set will be cut off.)
6. To wake up to the CD sound or taped program, set the TIMER switch of the CFD-5 to PLAY.
   To wake up to a radio program, set it to OFF.

Notes on timer setting

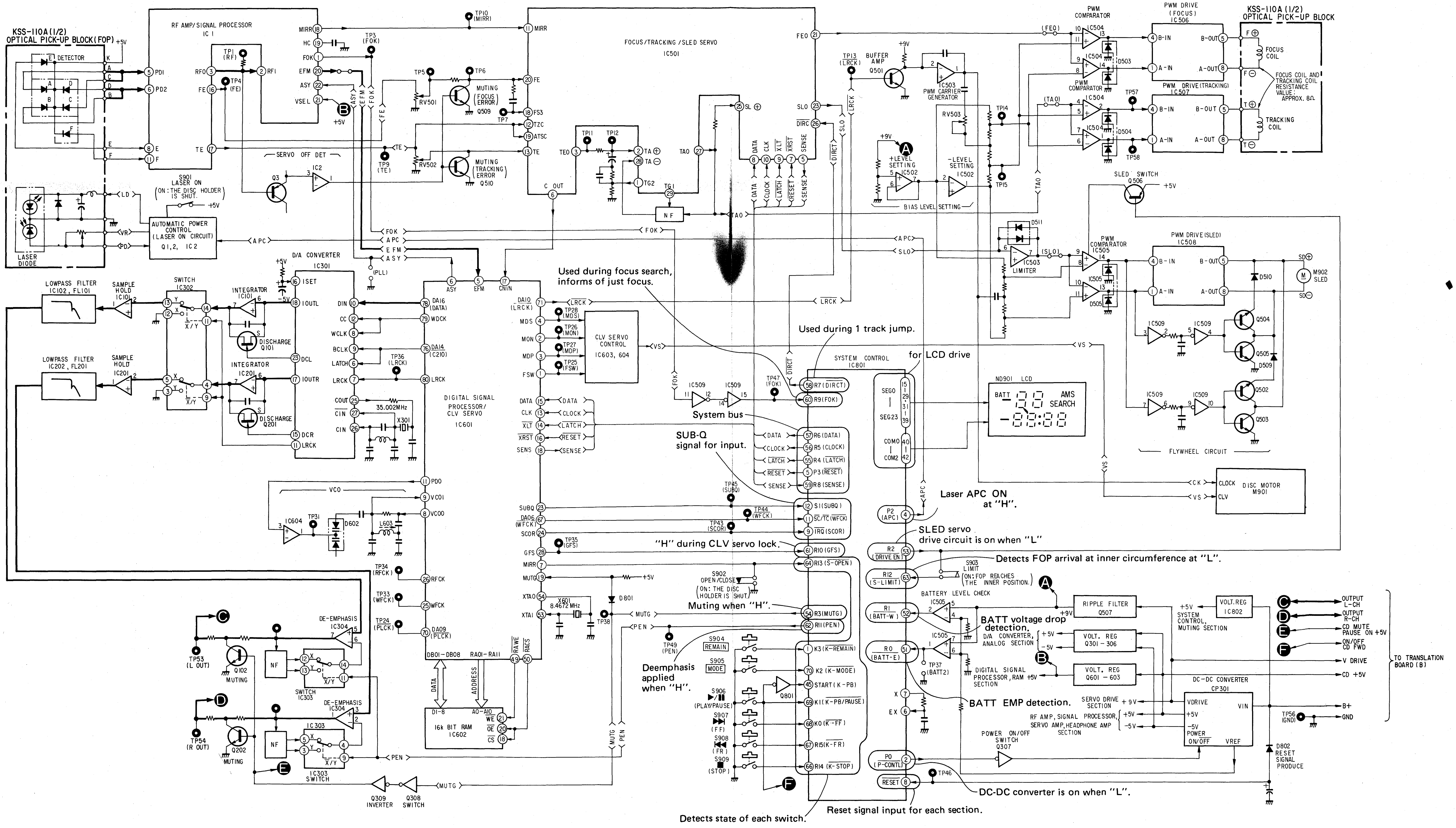
- Set the TIMER switch to OFF when not using the timer.
  If the power is on when this switch is set to the REC or PLAY position, recording or playback will start automatically.
- The TIMER switch of this set will function properly only if the set is turned on **after** the switch is set to REC or PLAY. Make sure that the power is turned off after setting the timer.

1-10. BLOCK DIAGRAMS

(A) RADIO AND CASSETTE-RECORDER SECTION


ANT
FM TELESCOPIC ANTENNA
FM RF AMP Q1
FM MIX AMP Q2
FM IF AMP Q3
B+
D5 TUNING
FM/AM IF AMP, DET
AM MIX AMP, OSC
IC51
FM OSC Q4
BUFFER AMP Q5
S1-2 BAND SELECT
AM ← FM MONO ← FM ST
D4 FM STEREO
FM MPX
IC52
R-CH
FL2
LPF
L4
AM FERRITE-ROD ANTENNA
S1-1 BAND SELECT
FM ST → FM MONO → AM
—L-CH—
J302 MIC MIXING
MIC AMP Q301,302
J301-1 LINE IN
HRP101-1 REC/PB HEAD
PREAMP IC351 (1/3)
RV101 (PB LEVEL)
MUTING Q101
CD
LINE IN
RADIO
TAPE
S304-2 FUNCTION
AGC AMP Q303 (1/2)
S306 DOLBY NR
ON
OFF
DOLBY NR AMP IC352
S303-3 REC/PB
S303-7 MUTING SWITCH
REC/PB
PB
REC
MUTING Q102
PB
S305-3 TAPE SELECT
NORMAL
METAL
S303-1 REC
REC/PB
AGC AMP Q304
S303-5 REC/PB
PB
REC
AGC AMP Q305
R-CH
REC AMP Q104
MUTING Q105
RV102 (REC LEVEL)
RV103 (REC BIAS)
S305-1 TAPE SELECT
NORMAL
METAL
HE101 ERASING HEAD
BIAS OSC UNIT
BIAS SWITCH Q306
S303-6 REC/PB
PB
REC
S307 ISS
1←2→3
PH751 LEADER TAPE DET
REVERSE DET Q611
SWITCHING Q612
SWITCHING Q613
AMS IC103
SWITCHING Q307
MUTING
SHUT-OFF
AMS
OSC
REC MUTE
SYSTEM CONTROL IC651
SWITCHING Q603
CLOCK SWITCH Q601
CURRENT AMP Q901
SPEED-DETECTION
Q902
D901
CD INPUT L-CH (TO CD UNIT)
S304-6 FUNCTION
LINE AMP Q103
J301-3 LINE OUT L
GRAPHIC EQUALIZER IC151
1·3·5·7·9
2·4·6·8·10
RV104 — 108 GRAPHIC EQUALIZER
RV109 VOLUME
POWER AMP IC354
J304 PHONES
J303 EXT SPEAKER
IMP 6 — 16Ω
SP101 SPEAKER 4Ω (WOOFER)
SP102 SPEAKER 4Ω (TWEETER)
CD MUTE (PAUSE ON+5V)
SYNCHRO START Q804,805
SYNCHRO START Q802,803
S401 ◀◀
S402 ◀
S403 ■
S405 ▶▶
S407 PAUSE ❚❚
S404 ▶
S406 ●
S602 EJECT DET
S601 TIMER
REC
OFF
PLAY
SWITCHING Q610
ON/OFF CD FWD
S601-2
S601-1
TIMER STAND BY DET Q602
S409 SYNCHRO TAPE & CD
Q614 SYNCHRO START
Q401
Q402
Q401,402 PAUSE DET
S901 ERASE PROOF (A TAB)
S902 ERASE PROOF (B TAB)
A TAB
B TAB
PL A
PL B
PL C
REC MUTE
D404
D403 PAUSE
D401
D402
—R-CH—
• SAME AS L-CH
S304-1 FUNCTION
B+ (TAPE)
B+ (RADIO SECTION)
B+ (DOLBY NR)
B+ (Q610) (S409)
D308 OPR BATT
B+ (CD UNIT)
(CD OPR)
B+ (SYSTEM CONTROL SECTION)
B+ (IC102,202)
VOL. REG Q607,609
S301 POWER
ON
OFF
LED DRIVE Q801
VOL. REG Q309,310
S304-2 FUNCTION
SOLENOID DRIVE Q604
SOLENOID DRIVE Q605
SOLENOID DRIVE Q606
PM901 SOLENOID A (FWD)
PM902 SOLENOID B (FF)
PM903 SOLENOID C (REW)
MOTOR DRIVE Q608
M
M901 MOTOR
RECT D701
T701 POWER TRANSFORMER
CNJ701 AC IN
J305 DC IN 12V
B+ (Q602)
DRY BATTERY SIZE "D"
(IEC DESIGNATION R20)
8PCS. 12V

(B) CD PLAYER SECTION



Used during focus search, informs of just focus.

Used during 1 track jump.

for LCD drive

System bus

SUB-Q signal for input.

"H" during CLV servo lock.

Muting when "H".

Deemphasis applied when "H".

Laser APC ON at "H".

SLED servo drive circuit is on when "L"

Detects FOP arrival at inner circumference at "L".

BATT voltage drop detection.

BATT EMP detection.

DC-DC converter is on when "L".

Reset signal input for each section.

Detects state of each switch.

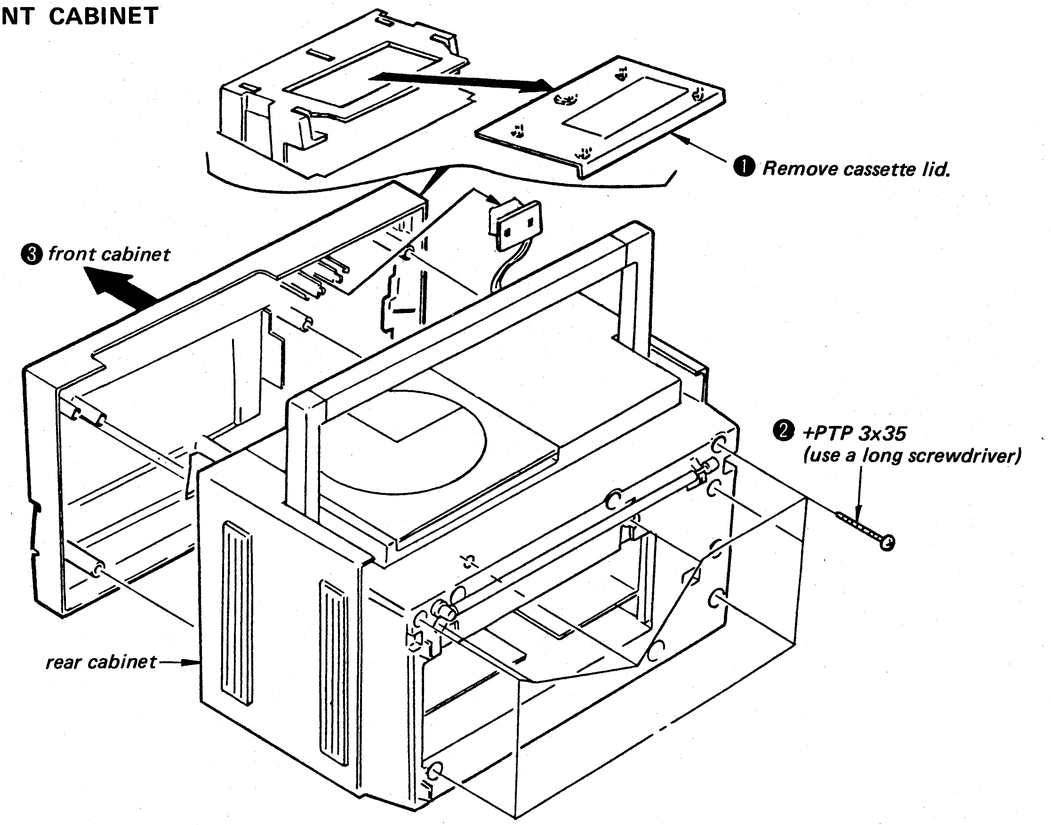
KSS-110A (1/2) OPTICAL PICK-UP BLOCK (FOP)
DETECTOR
LASER DIODE
RF AMP/SIGNAL PROCESSOR IC1
AUTOMATIC POWER CONTROL (LASER ON CIRCUIT) Q1,2, IC2
S901 LASER ON (ON: THE DISC HOLDER IS SHUT.)
SERVO OFF DET
MUTING (FOCUS ERROR) Q509
MUTING (TRACKING ERROR) Q510
FOCUS/TRACKING/SLED SERVO IC501
D/A CONVERTER IC301
LOWPASS FILTER IC102, FL101
LOWPASS FILTER IC202, FL201
SAMPLE HOLD IC101
SAMPLE HOLD IC201
SWITCH IC302
INTEGRATOR IC101
INTEGRATOR IC201
DISCHARGE Q101
DISCHARGE Q201
DIGITAL SIGNAL PROCESSOR/CLV SERVO IC601
CLV SERVO CONTROL IC603, 604
VCO
IC604
35.002MHz X301
X601 8.4672MHz
16k BIT RAM IC602
DE-EMPHASIS IC304
SWITCH IC303
MUTING Q102
MUTING Q202
TP53 (L OUT)
TP54 (R OUT)
Q309 INVERTER
Q308 SWITCH
BUFFER AMP Q501
PWM CARRIER GENERATOR IC503
+LEVEL SETTING IC502
-LEVEL SETTING IC502
BIAS LEVEL SETTING
PWM COMPARATOR IC504
PWM DRIVE (FOCUS) IC506
PWM DRIVE (TRACKING) IC507
KSS-110A (1/2) OPTICAL PICK-UP BLOCK
FOCUS COIL
TRACKING COIL
FOCUS COIL AND TRACKING COIL RESISTANCE VALUE: APPROX. 8Ω
SLED SWITCH Q506
PWM COMPARATOR IC505
PWM DRIVE (SLED) IC508
LIMITER IC503
M902 SLED
FLYWHEEL CIRCUIT
SYSTEM CONTROL IC801
ND901 LCD
BATT AMS SEARCH
DISC MOTOR M901
S902 OPEN/CLOSE (ON: THE DISC HOLDER IS SHUT.)
S903 LIMIT (ON: FOP REACHES THE INNER POSITION.)
S904 REMAIN
S905 MODE
S906 ▶/II (PLAY/PAUSE)
S907 ▶▶I (FF)
S908 I◀◀ (FR)
S909 ■ (STOP)
BATTERY LEVEL CHECK
RIPPLE FILTER Q507
VOLT. REG Q301 - 306
VOLT. REG Q601 - 603
VOLT. REG IC802
D/A CONVERTER, ANALOG SECTION
DIGITAL SIGNAL PROCESSOR, RAM
SYSTEM CONTROL, MUTING SECTION
SERVO DRIVE SECTION
RF AMP, SIGNAL PROCESSOR, SERVO AMP, HEADPHONE AMP SECTION
POWER ON/OFF SWITCH Q307
DC-DC CONVERTER CP301
D802 RESET SIGNAL PRODUCE
OUTPUT L-CH
OUTPUT R-CH
CD MUTE PAUSE ON +5V
ON/OFF CD FWD
V DRIVE
CD +5V
B+
GND
TO TRANSLATION BOARD (B)

SECTION 2
DISASSEMBLY

2-1. DISASSEMBLY

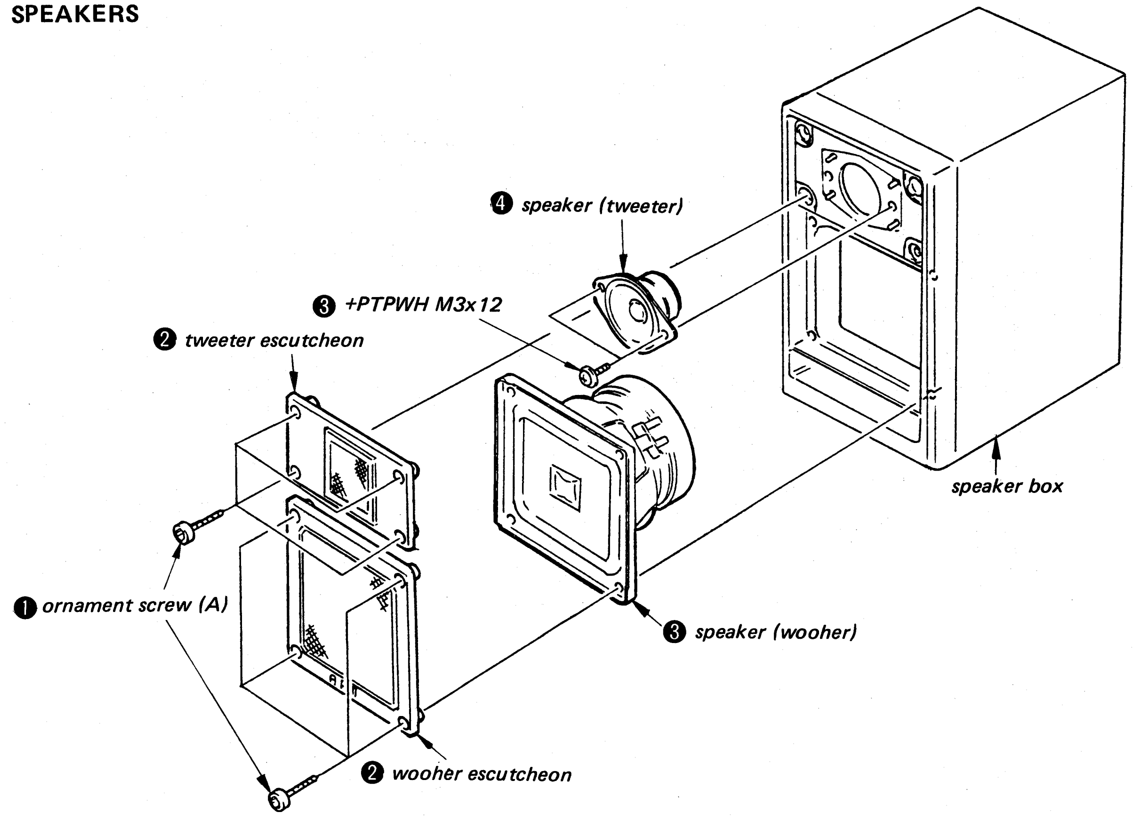
- Note: Follow the disassembly procedure in the numerical order given.

FRONT CABINET



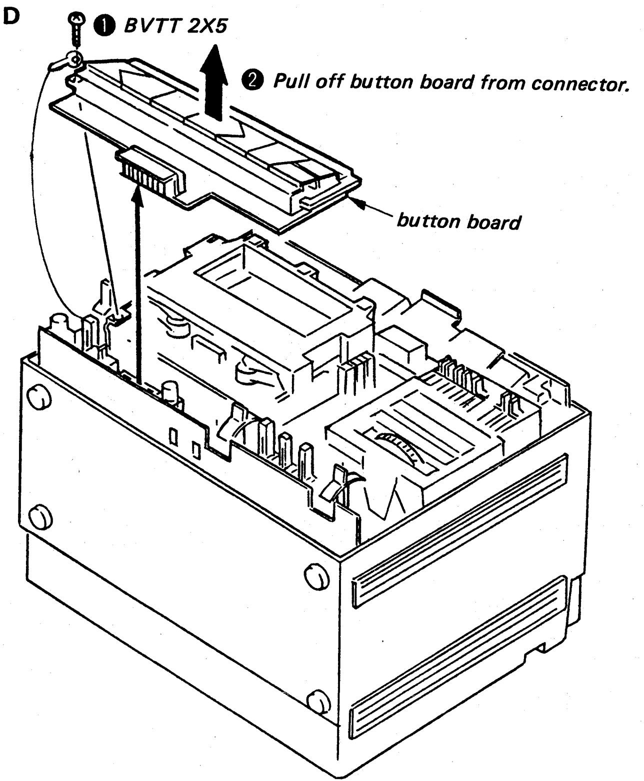
➊ Remove cassette lid.
➌ front cabinet
➋ +PTP 3x35
(use a long screwdriver)
rear cabinet

SPEAKERS



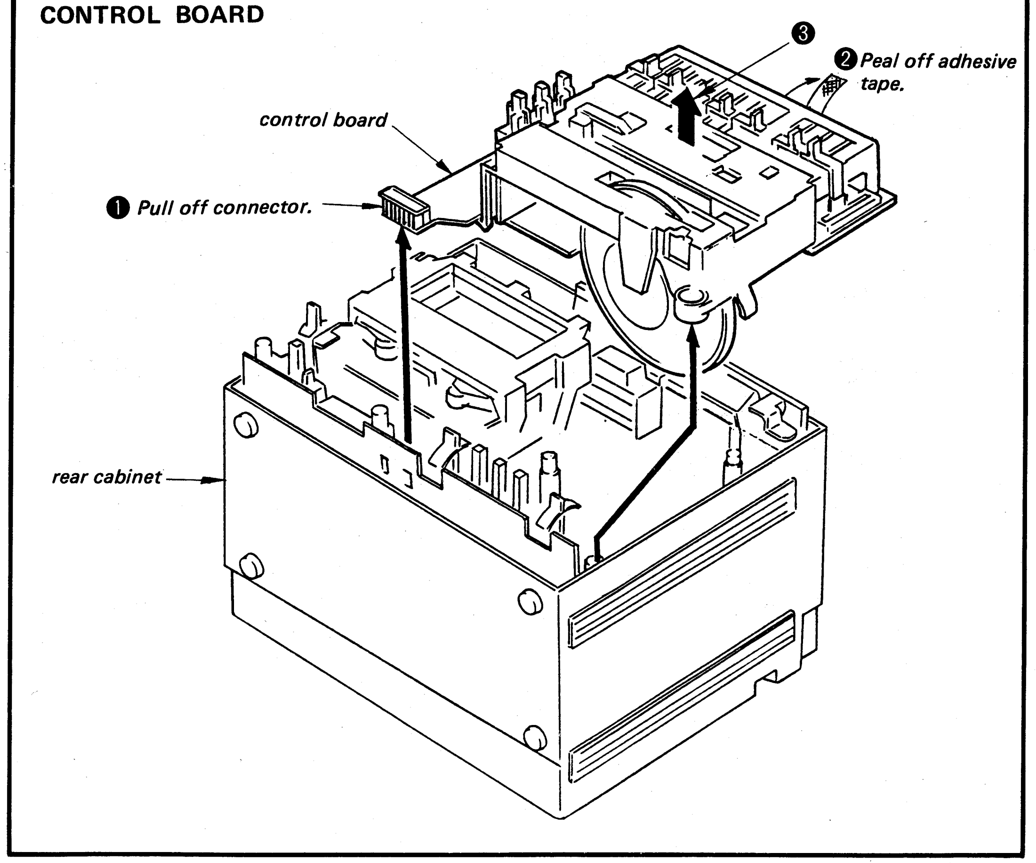
➍ speaker (tweeter)
➌ +PTPWH M3x12
➋ tweeter escutcheon
speaker box
➊ ornament screw (A)
➌ speaker (wooher)
➋ wooher escutcheon

BUTTON BOARD



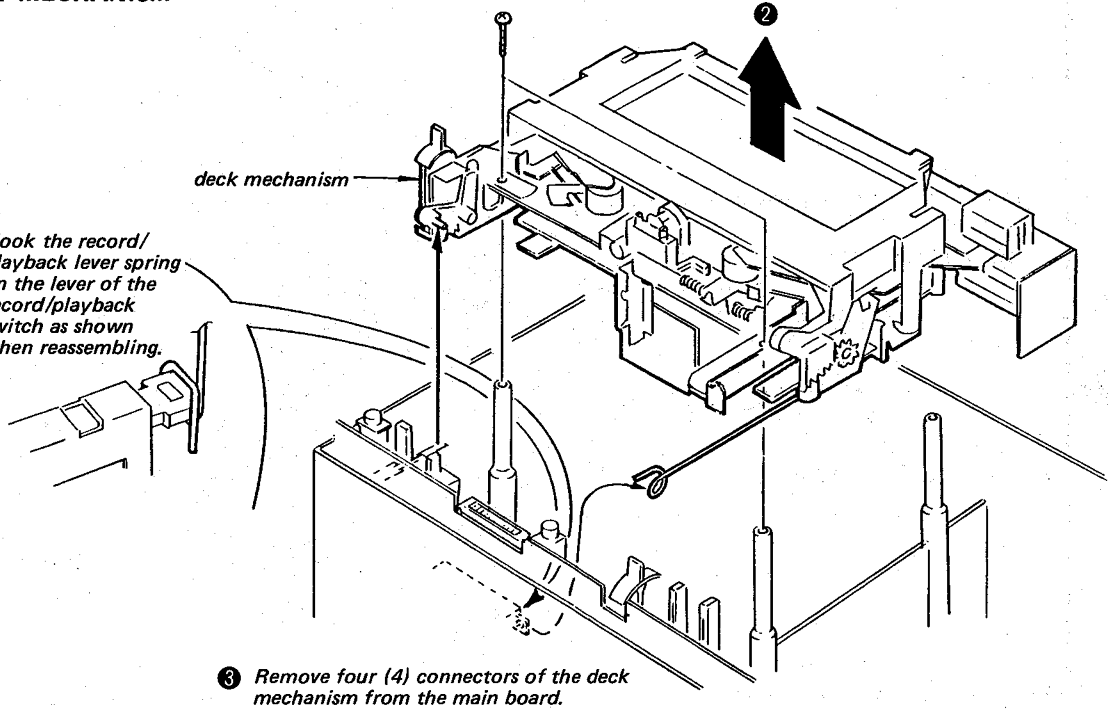
➊ BVTT 2X5
➋ Pull off button board from connector.
button board

CONTROL BOARD



➌
➋ Peal off adhesive tape.
control board
➊ Pull off connector.
rear cabinet

DECK MECHANISM



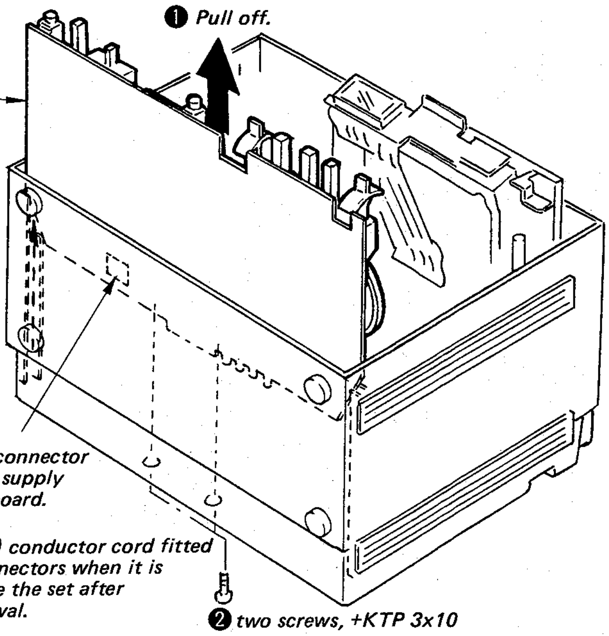
❶ *BV3X12*

❷

Note: *Hook the record/playback lever spring on the lever of the record/playback switch as shown when reassembling.*

❸ *Remove four (4) connectors of the deck mechanism from the main board.*

MAIN BOARD



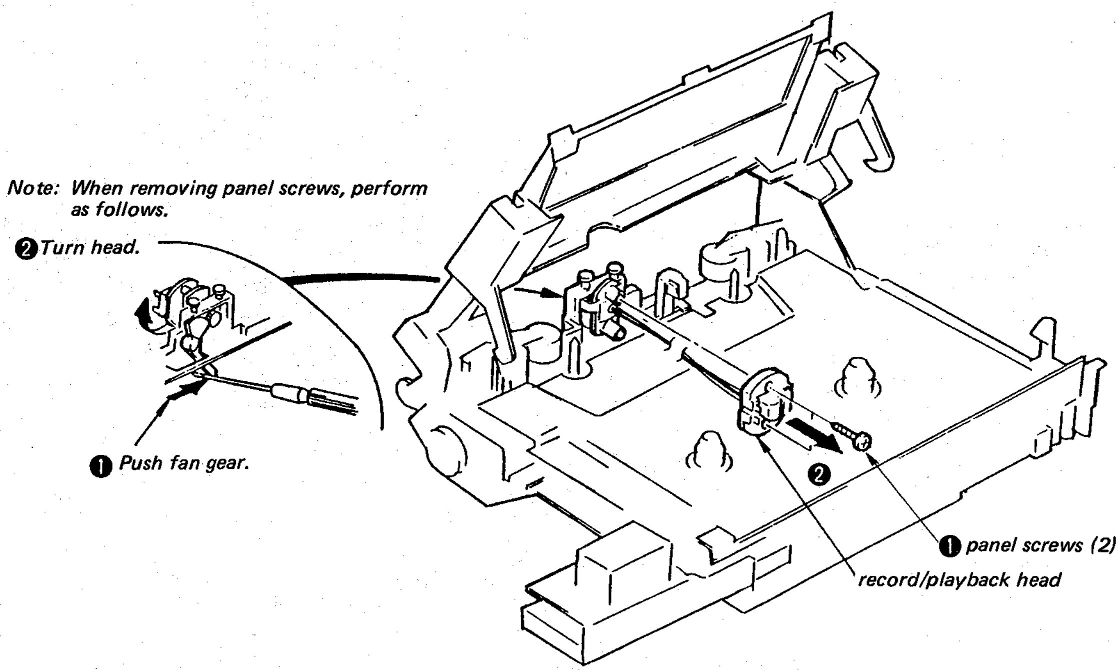
❶ *Pull off.*

❷ *two screws, +KTP 3x10*

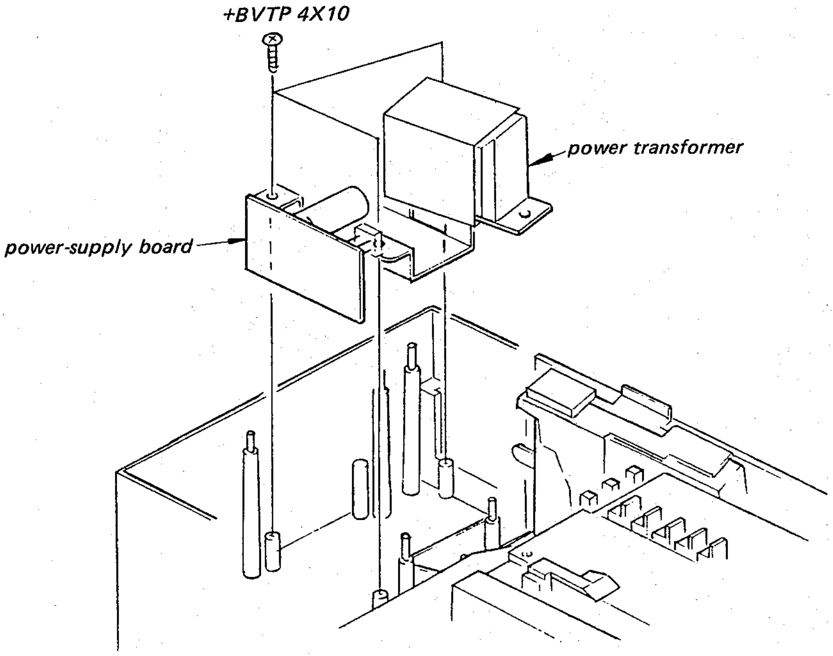
❸ *Remove the connector of the power supply at the main board.*

Note: *Prepare a four (4) conductor cord fitted with suitable connectors when it is needed to operate the set after main-board removal.*

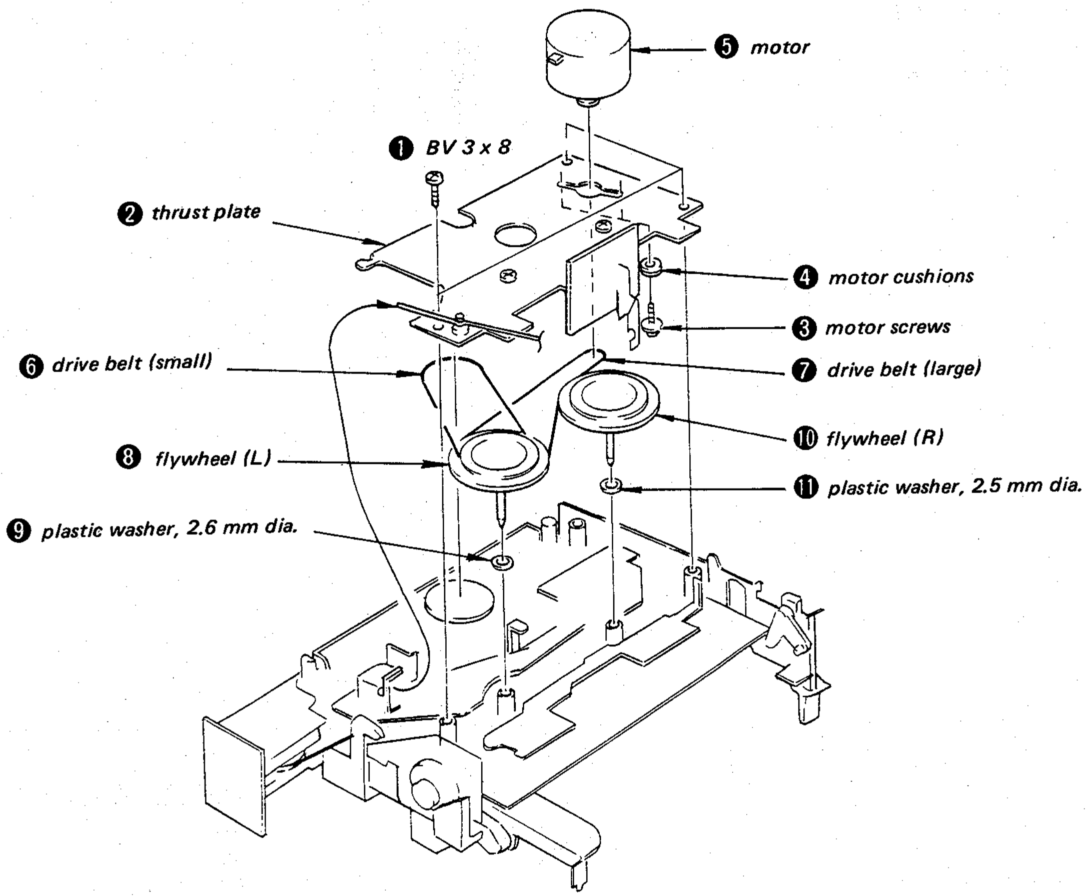
RECORD / PLAYBACK HEAD


Note: When removing panel screws, perform as follows.
❷Turn head.
❶ Push fan gear.
❷
❶ panel screws (2)
record/playback head

POWER SUPPLY BOARD and POWER TRANSFORMER

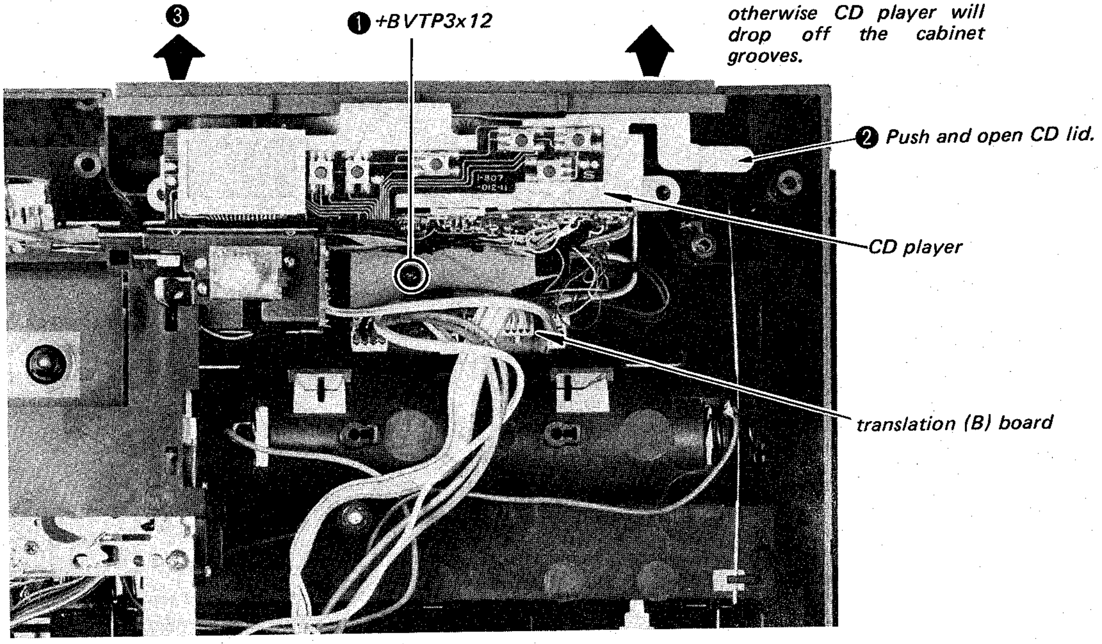

+BVTP 4X10
power transformer
power-supply board

THRUST PLATE, MOTOR and FLYWHEEL

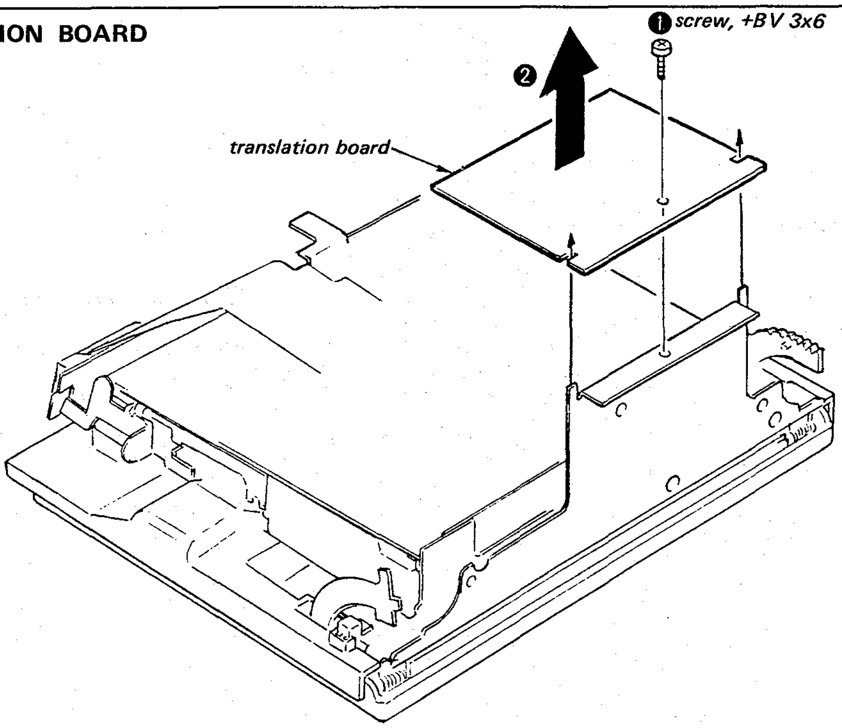

⑤ motor
① BV 3 x 8
② thrust plate
④ motor cushions
③ motor screws
⑥ drive belt (small)
⑦ drive belt (large)
⑩ flywheel (R)
⑧ flywheel (L)
⑪ plastic washer, 2.5 mm dia.
⑨ plastic washer, 2.6 mm dia.

CD PLAYER SECTION

③ Securely grip both sides of CD player and pull or slide it off.
Do not incline rear cabinet downward toward front, otherwise CD player will drop off the cabinet grooves.

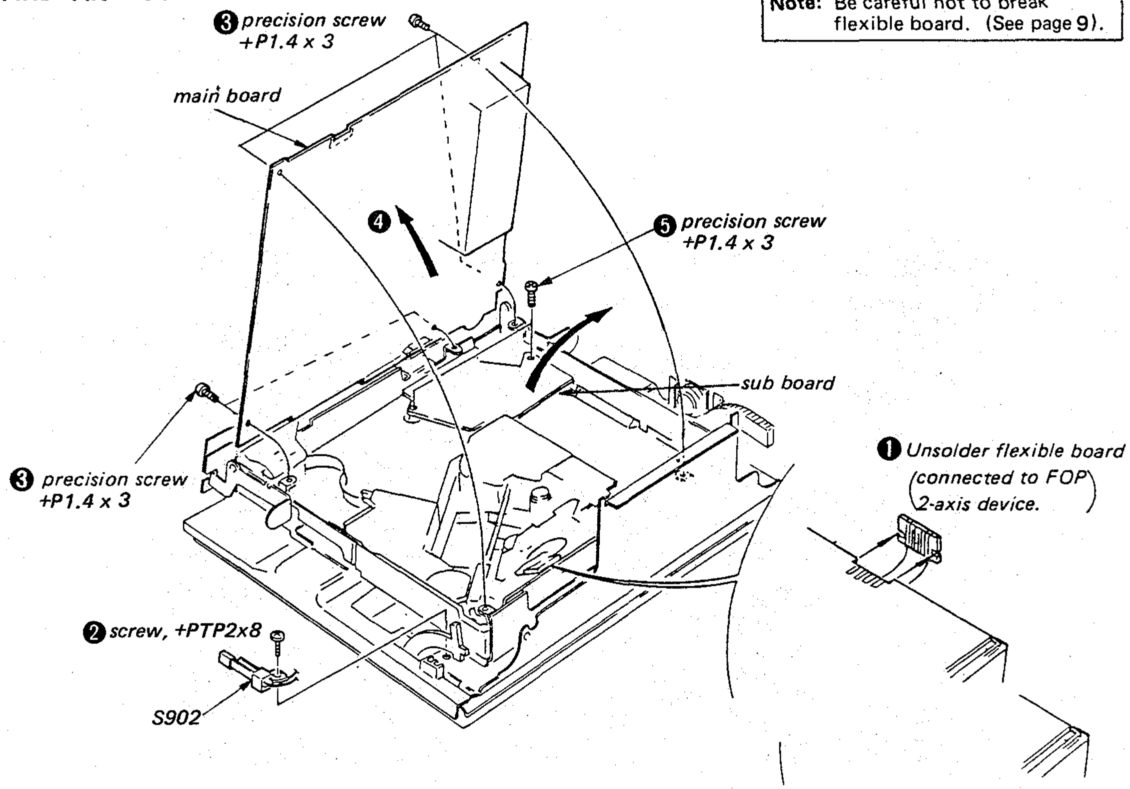

③
① +BVTP3x12
② Push and open CD lid.
CD player
translation (B) board

TRANSLATION BOARD

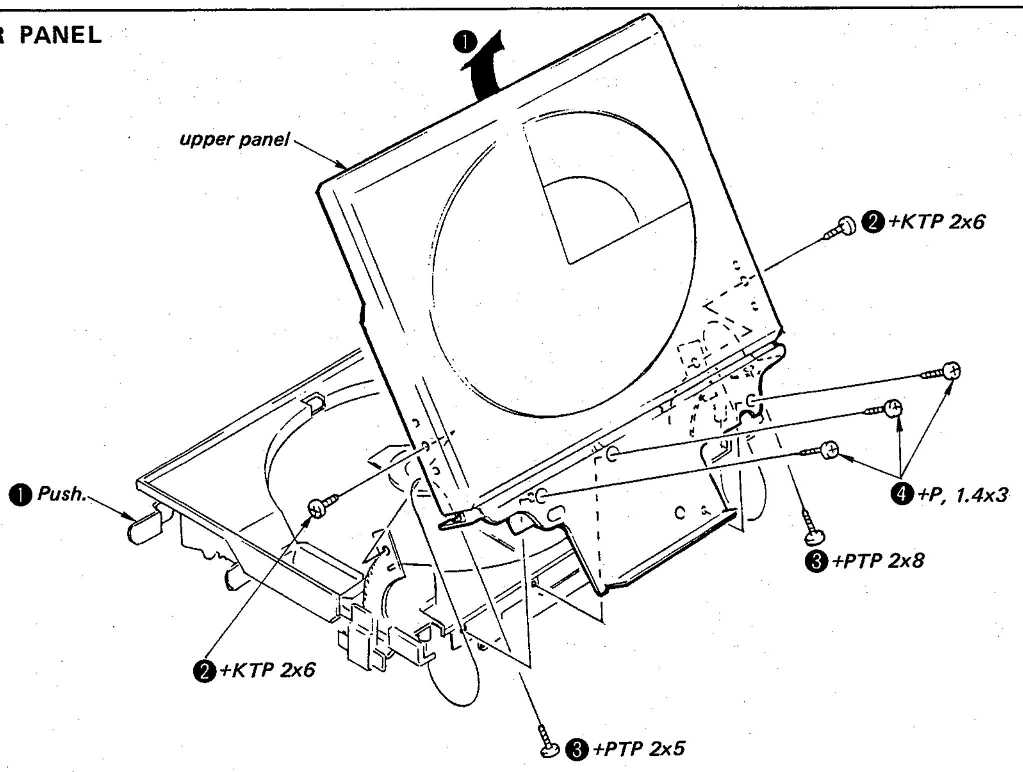

❶ screw, +BV 3x6
❷
translation board

MAIN BOARD AND SUB BOARD

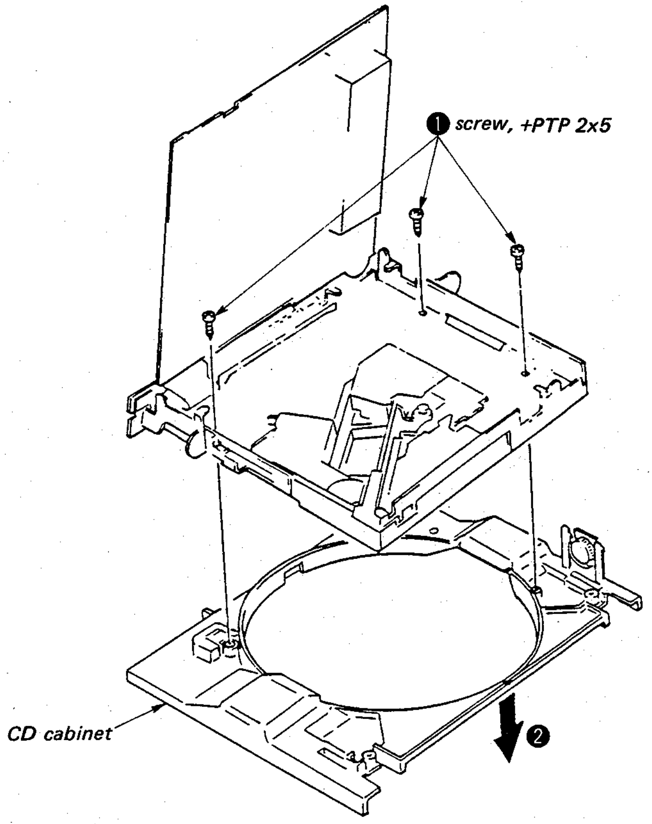
Note: Be careful not to break flexible board. (See page 9).


❸ precision screw +P1.4 x 3
main board
❹
❺ precision screw +P1.4 x 3
sub board
❶ Unsolder flexible board (connected to FOP 2-axis device.)
❸ precision screw +P1.4 x 3
❷ screw, +PTP2x8
S902

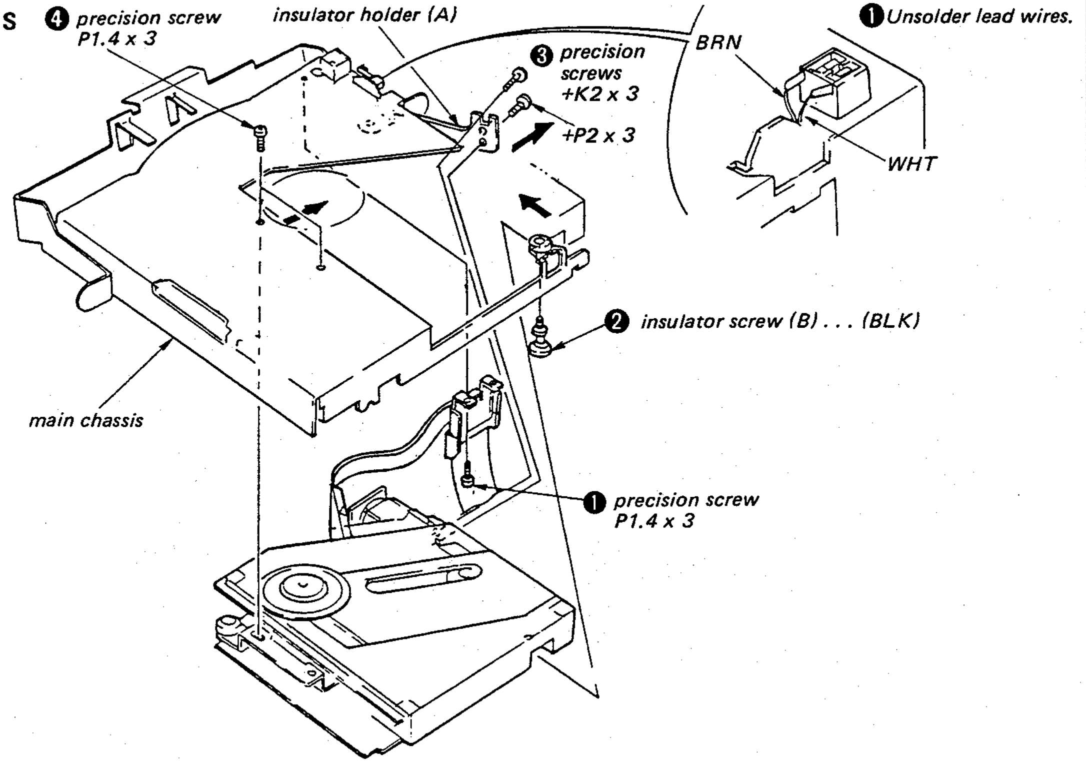
UPPER PANEL


❶
upper panel
❷ +KTP 2x6
❶ Push.
❹ +P, 1.4x3
❸ +PTP 2x8
❷ +KTP 2x6
❸ +PTP 2x5

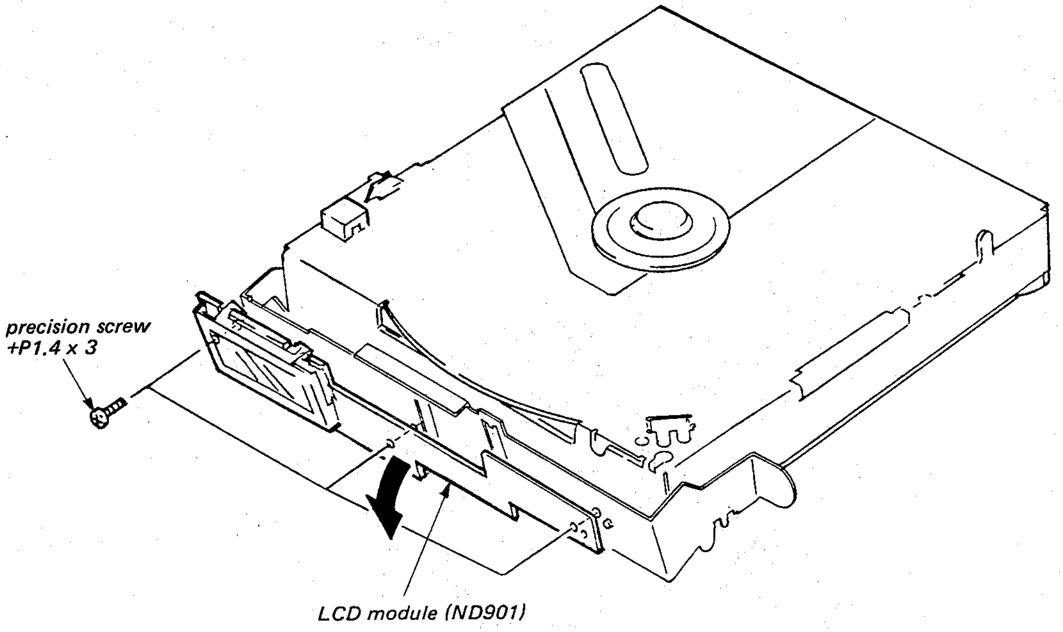
CD CABINET


❶ screw, +PTP 2x5
CD cabinet
❷

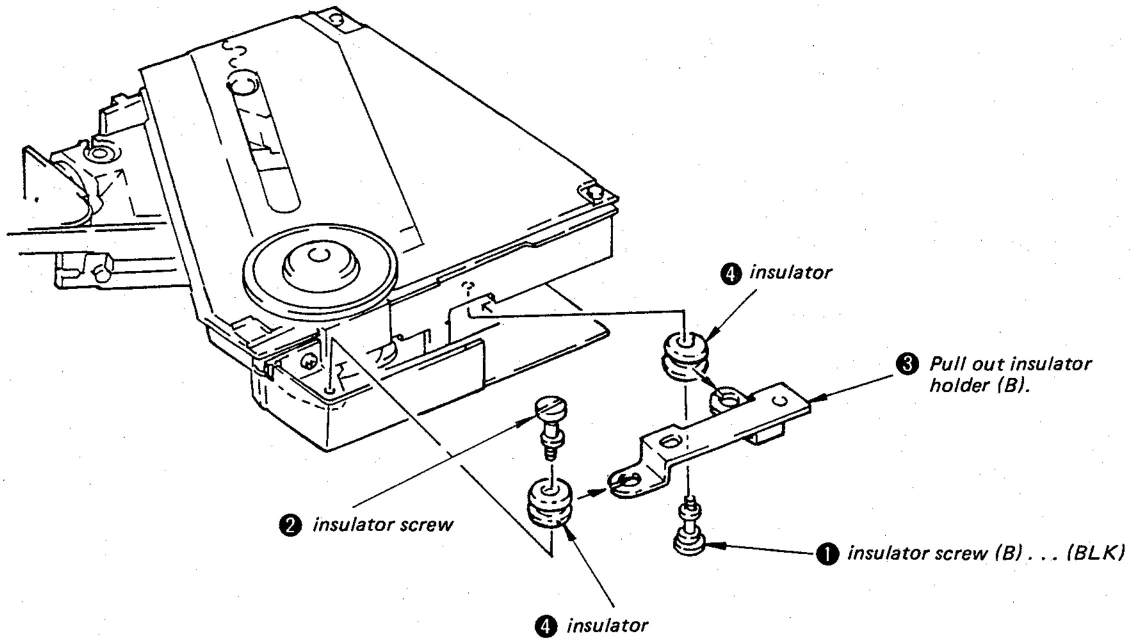
MAIN CHASSIS


④ precision screw P1.4 x 3
insulator holder (A)
❶ Unsolder lead wires.
③ precision screws +K2 x 3
+P2 x 3
BRN
WHT
② insulator screw (B) . . . (BLK)
main chassis
❶ precision screw P1.4 x 3

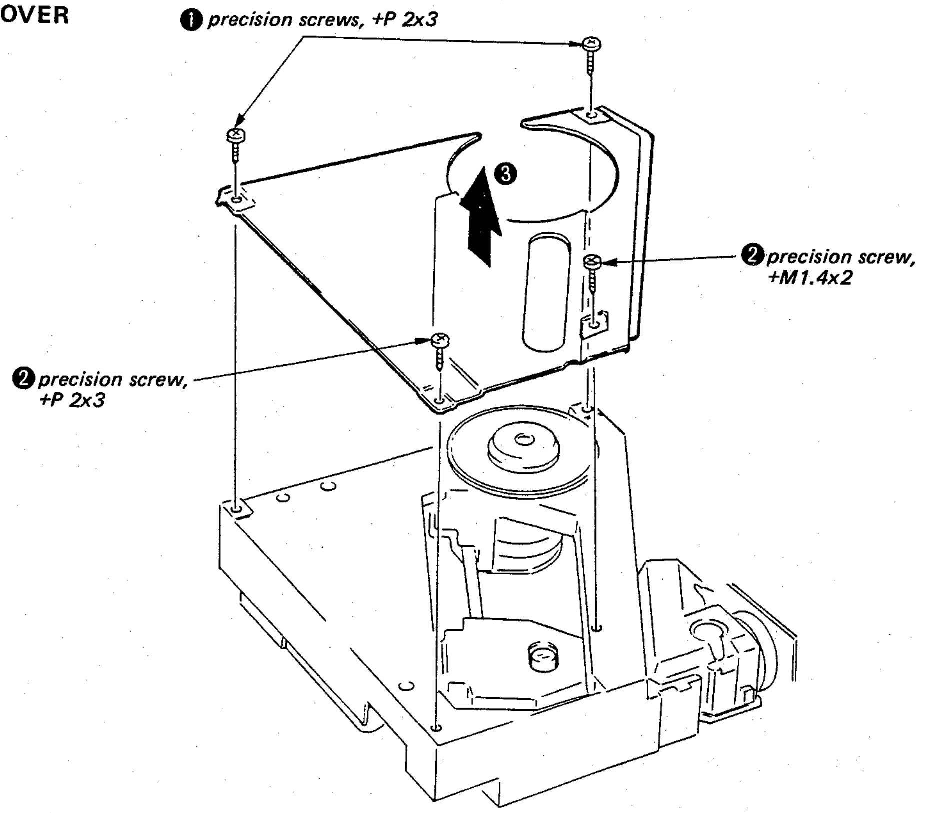
LCD MODULE (ND901)


precision screw +P1.4 x 3
LCD module (ND901)

INSULATOR


❹ insulator
❸ Pull out insulator holder (B).
❷ insulator screw
❶ insulator screw (B) . . . (BLK)
❹ insulator

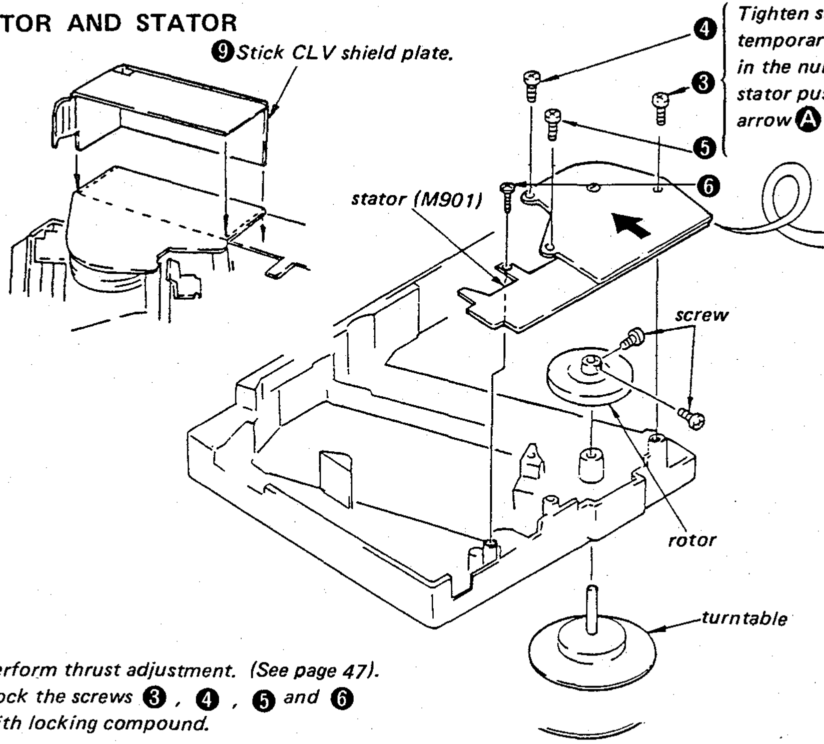
MD COVER


❶ precision screws, +P 2x3
❸
❷ precision screw, +M1.4x2
❷ precision screw, +P 2x3

2-2. REASSEMBLY OF MECHANISM OF CD SECTION

Note: Follow the reassembly procedure in the numerical order.

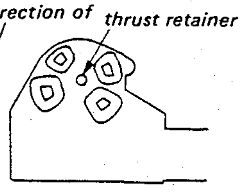
ROTOR AND STATOR



④
③
⑤
⑥
stator (M901)
screw
rotor
turntable

⑨ *Stick CLV shield plate.*

Tighten screws ③, ④ and ⑤ temporarily. Tighten screws M1.4 x 4 in the numerical order given with stator pushed in the direction of arrow Ⓐ.



thrust retainer

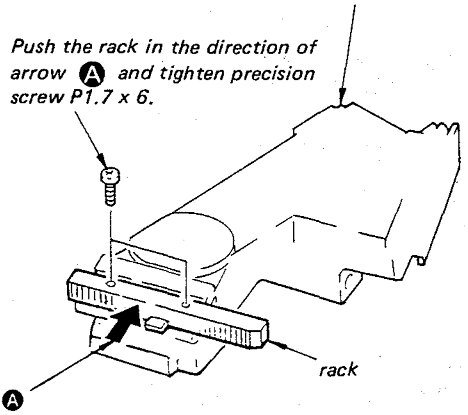
② *Apply grease (SG101 or SGL-501) to thrust retainer.*

① *Reassemble referring to rotor installation in mechanical adjustment on page 47.*

⑦ *Perform thrust adjustment. (See page 47).*

⑧ *Lock the screws ③, ④, ⑤ and ⑥ with locking compound.*

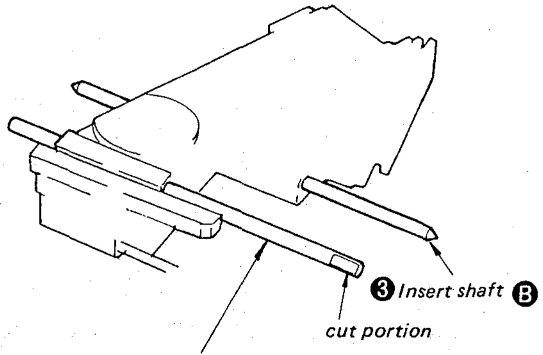
RACK AND SHAFT A, B



optical pick-up block (FOP)
rack
Ⓐ

① *Push the rack in the direction of arrow Ⓐ and tighten precision screw P1.7 x 6.*

Ⓐ *(Push center portion of rack between two screws at a right angle against rack.)*

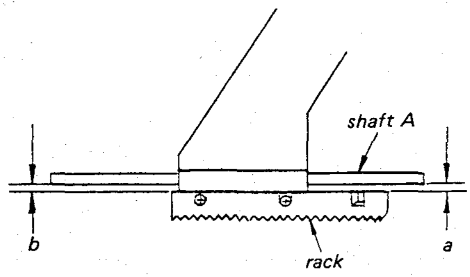


cut portion

③ *Insert shaft Ⓑ*

② *Insert shaft Ⓐ.*
(Be careful not to insert it from tip with cut portion.)

④ *Confirm that a = b. If not, perform again from ①.*



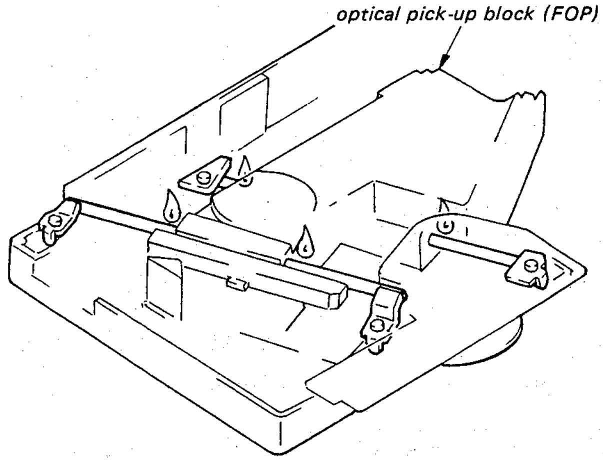
shaft A
b
a
rack

Refer to NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK (KSS-110A) on page 6.

Refer to NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK (KSS-110A) on page 6.

LUBLICATION TO SHAFTS A, B

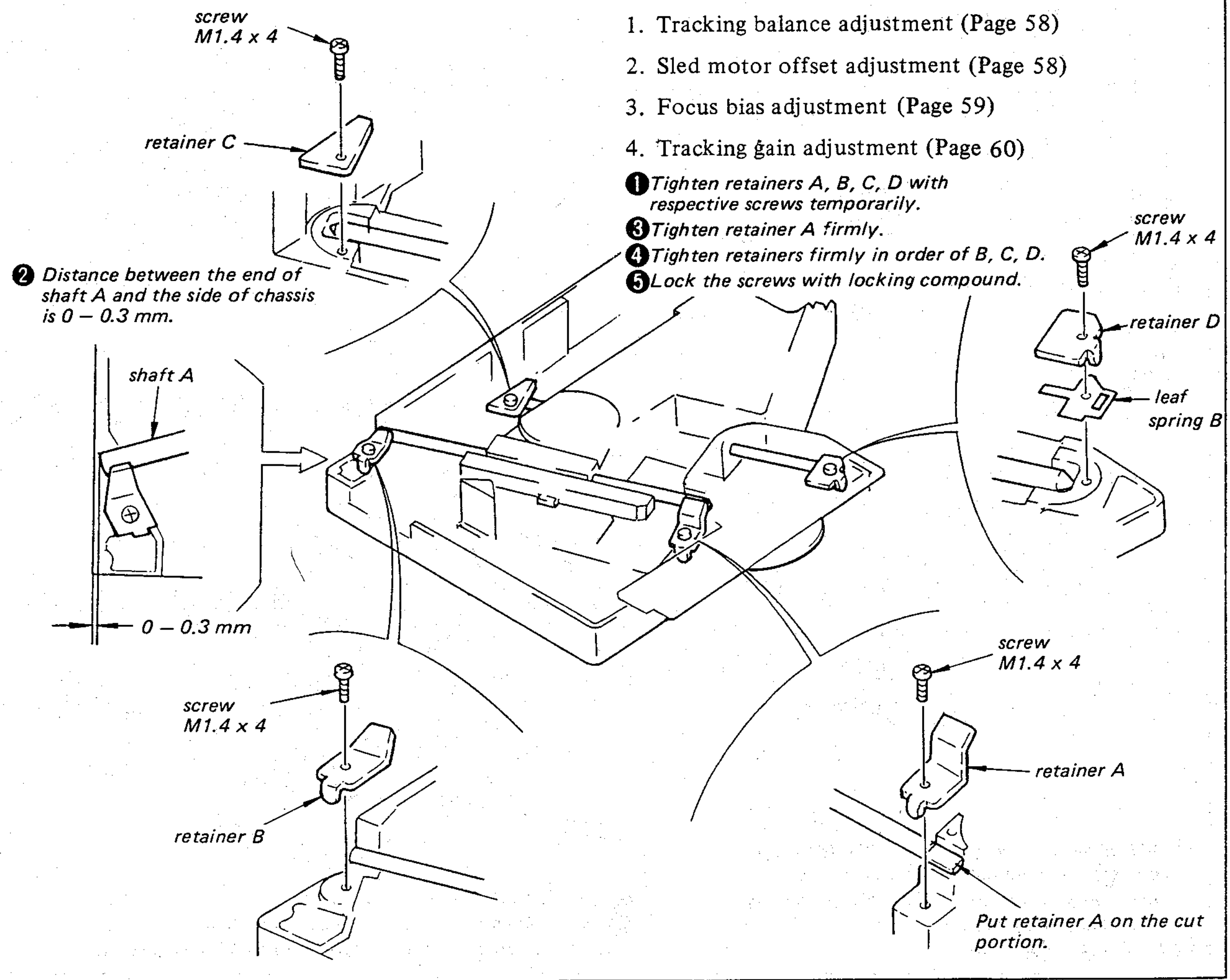
❶ *Apply a drop of hydro fluid EP-56 (part no. 7-661-018-01) to four portions marked 💧 .*
❷ *Move FOP right and left two or three times to smooth them.*
❸ *Lift up mechanical section and incline it in the right or left direction. Confirm that FOP is moved smoothly with itself-weight.*


optical pick-up block (FOP)

OPTICAL PICK-UP BLOCK

When replacing optical pick-up block, confirm and adjust the following items in the numerical order given.

1. Tracking balance adjustment (Page 58)
2. Sled motor offset adjustment (Page 58)
3. Focus bias adjustment (Page 59)
4. Tracking gain adjustment (Page 60)

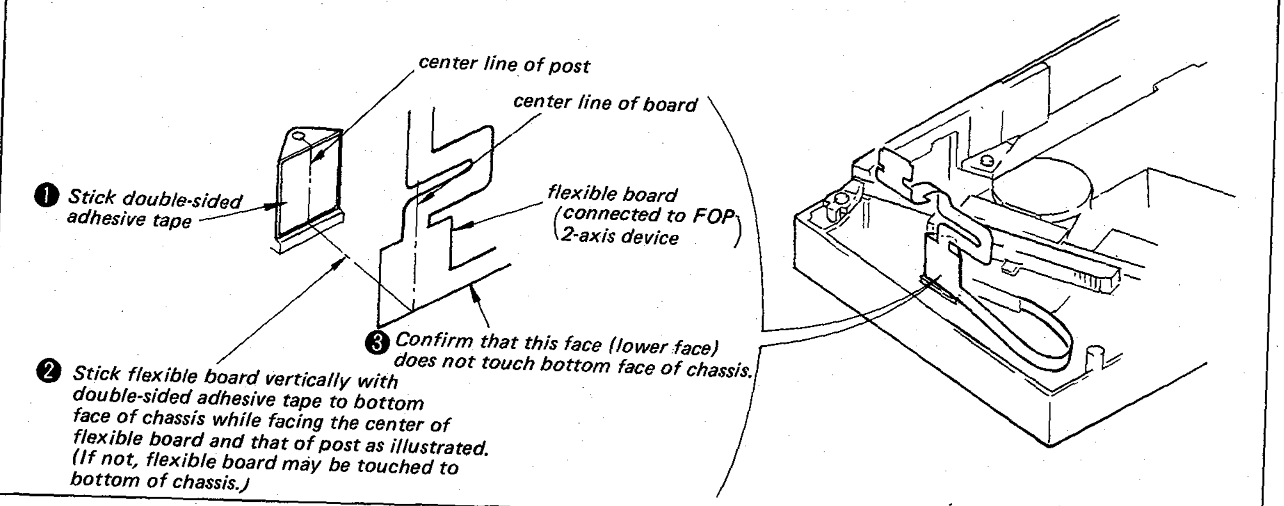

❶ *Tighten retainers A, B, C, D with respective screws temporarily.*
❷ *Distance between the end of shaft A and the side of chassis is 0 – 0.3 mm.*
❸ *Tighten retainer A firmly.*
❹ *Tighten retainers firmly in order of B, C, D.*
❺ *Lock the screws with locking compound.*

Put retainer A on the cut portion.

screw
M1.4 x 4
retainer C
shaft A
0 – 0.3 mm
screw
M1.4 x 4
retainer B
screw
M1.4 x 4
retainer D
leaf
spring B
screw
M1.4 x 4
retainer A

Refer to NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK (KSS-110A) on page 6.

ATTACHMENT OF FLEXIBLE BOARD


center line of post
center line of board
flexible board (connected to FOP 2-axis device)

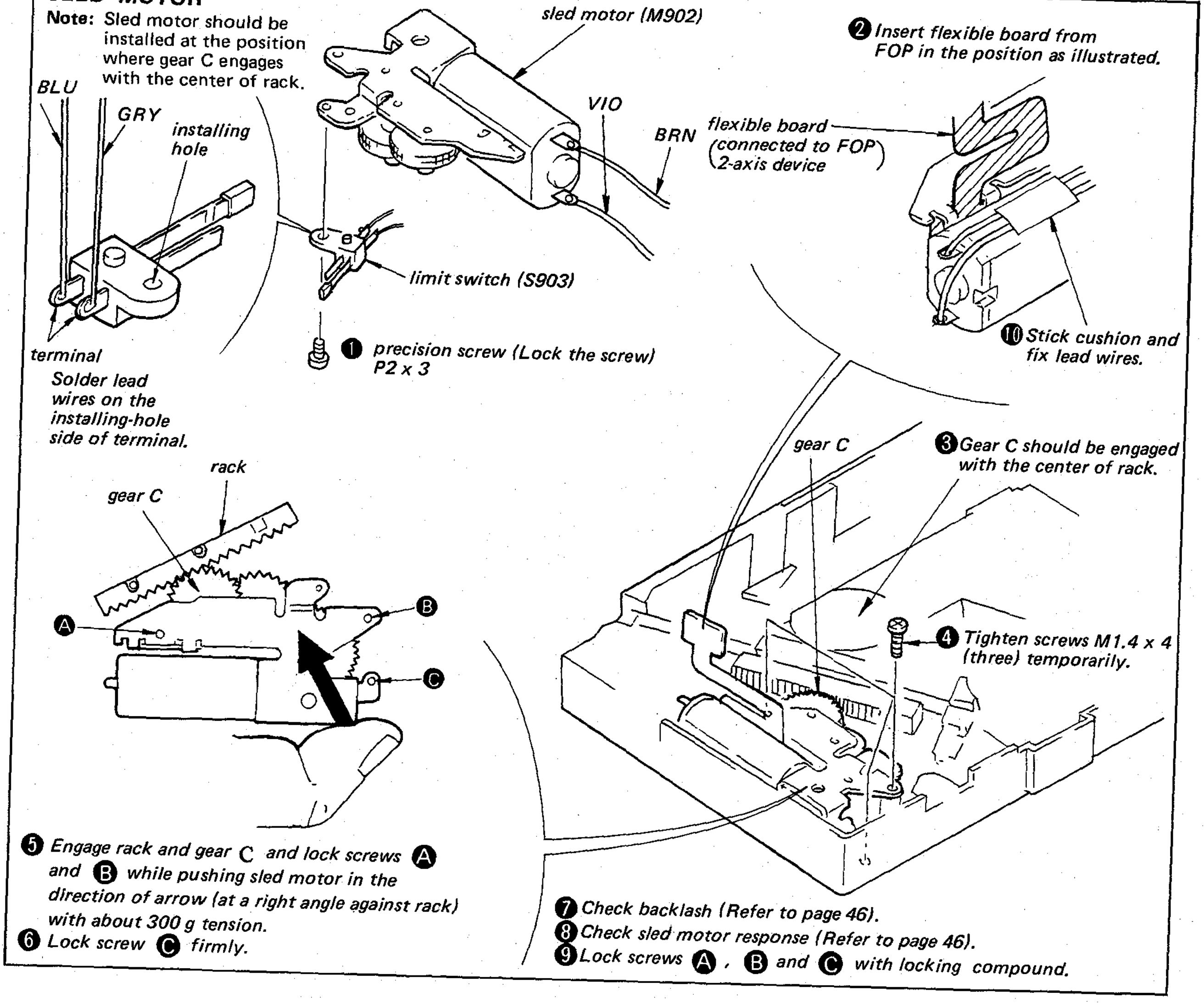
① *Stick double-sided adhesive tape*

② *Stick flexible board vertically with double-sided adhesive tape to bottom face of chassis while facing the center of flexible board and that of post as illustrated. (If not, flexible board may be touched to bottom of chassis.)*

③ *Confirm that this face (lower face) does not touch bottom face of chassis.*

SLED MOTOR

Note: Sled motor should be installed at the position where gear C engages with the center of rack.


BLU
GRY
installing hole
terminal
sled motor (M902)
VIO
BRN
limit switch (S903)
flexible board (connected to FOP 2-axis device)
rack
gear C
gear C
Ⓐ
Ⓑ
Ⓒ

Solder lead wires on the installing-hole side of terminal.

① *precision screw (Lock the screw) P2 x 3*

② *Insert flexible board from FOP in the position as illustrated.*

③ *Gear C should be engaged with the center of rack.*

④ *Tighten screws M1.4 x 4 (three) temporarily.*

⑤ *Engage rack and gear C and lock screws* Ⓐ *and* Ⓑ *while pushing sled motor in the direction of arrow (at a right angle against rack) with about 300 g tension.*

⑥ *Lock screw* Ⓒ *firmly.*

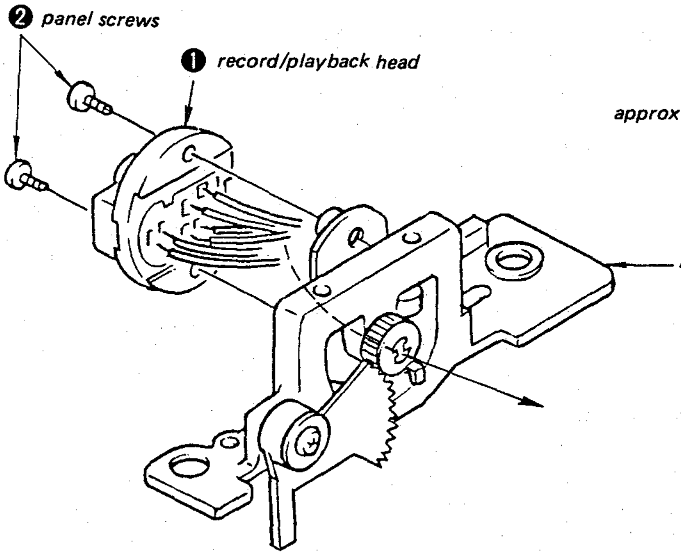
⑦ *Check backlash (Refer to page 46).*

⑧ *Check sled motor response (Refer to page 46).*

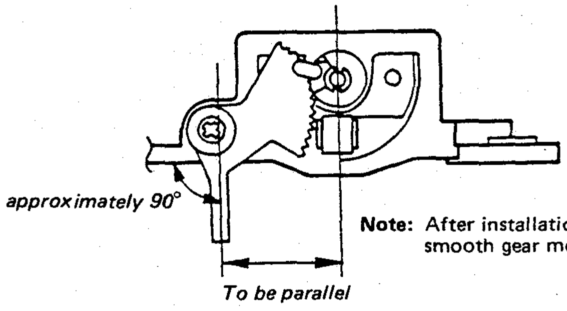
⑨ *Lock screws* Ⓐ *,* Ⓑ *and* Ⓒ *with locking compound.*

⑩ *Stick cushion and fix lead wires.*

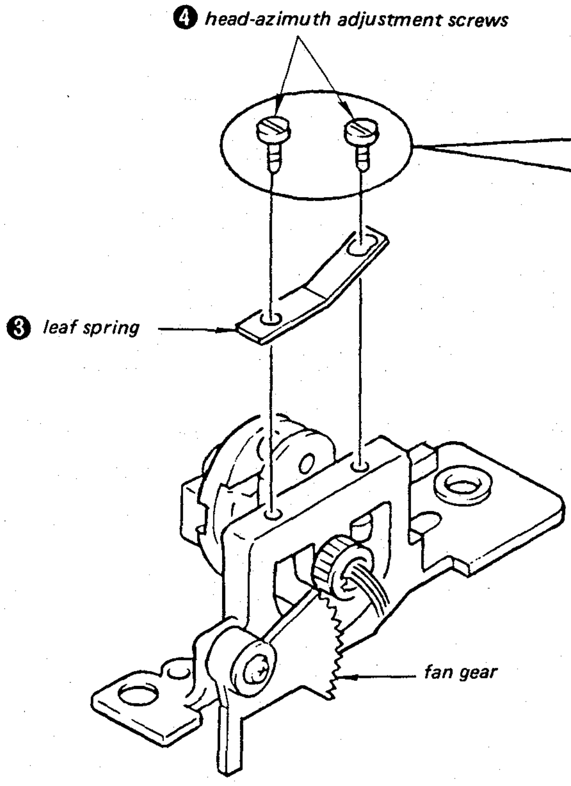
INSTALLING THE RECORD/PLAYBACK/ERASE HEAD


② panel screws
① record/playback head
head-mounting base

Installation of Fan Gear

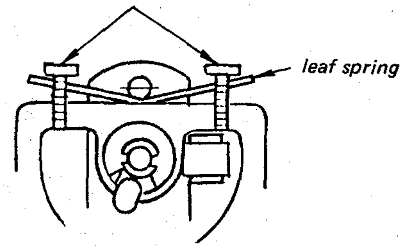

approximately 90°
To be parallel

Note: After installation, check for a smooth gear movement.


④ head-azimuth adjustment screws
③ leaf spring
fan gear

⑤ *Reinstall head-mounting base on the head chassis.*

⑥ *By turning the record/playback head to both forward and reverse positions, preliminarily set the both head-azimuth adjustment screws so that the head positions almost in parallel with the tape-travel path.*

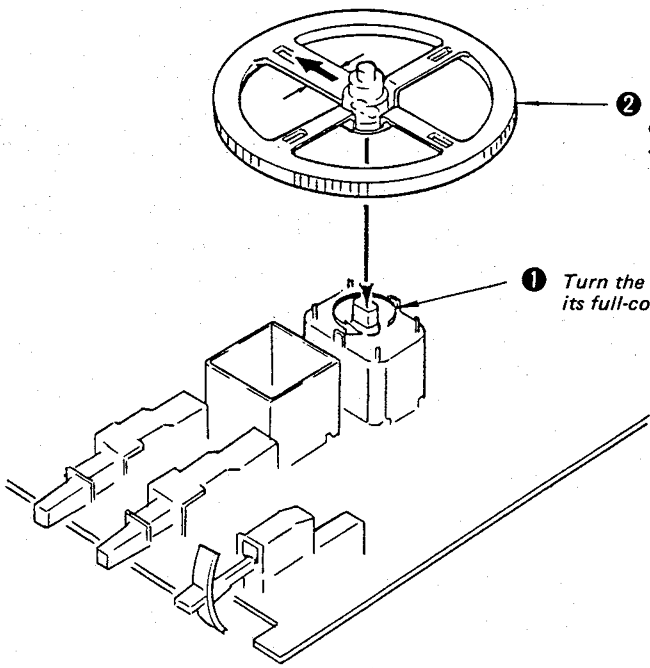

leaf spring

⑦ *Perform the Tape-Path Adjustment in the Mechanical Adjustments section.*

⑧ *Perform the Record/playback Head Azimuth Adjustment in the Electrical Adjustments section.*

REINSTALLING THE CONTROL BOARD

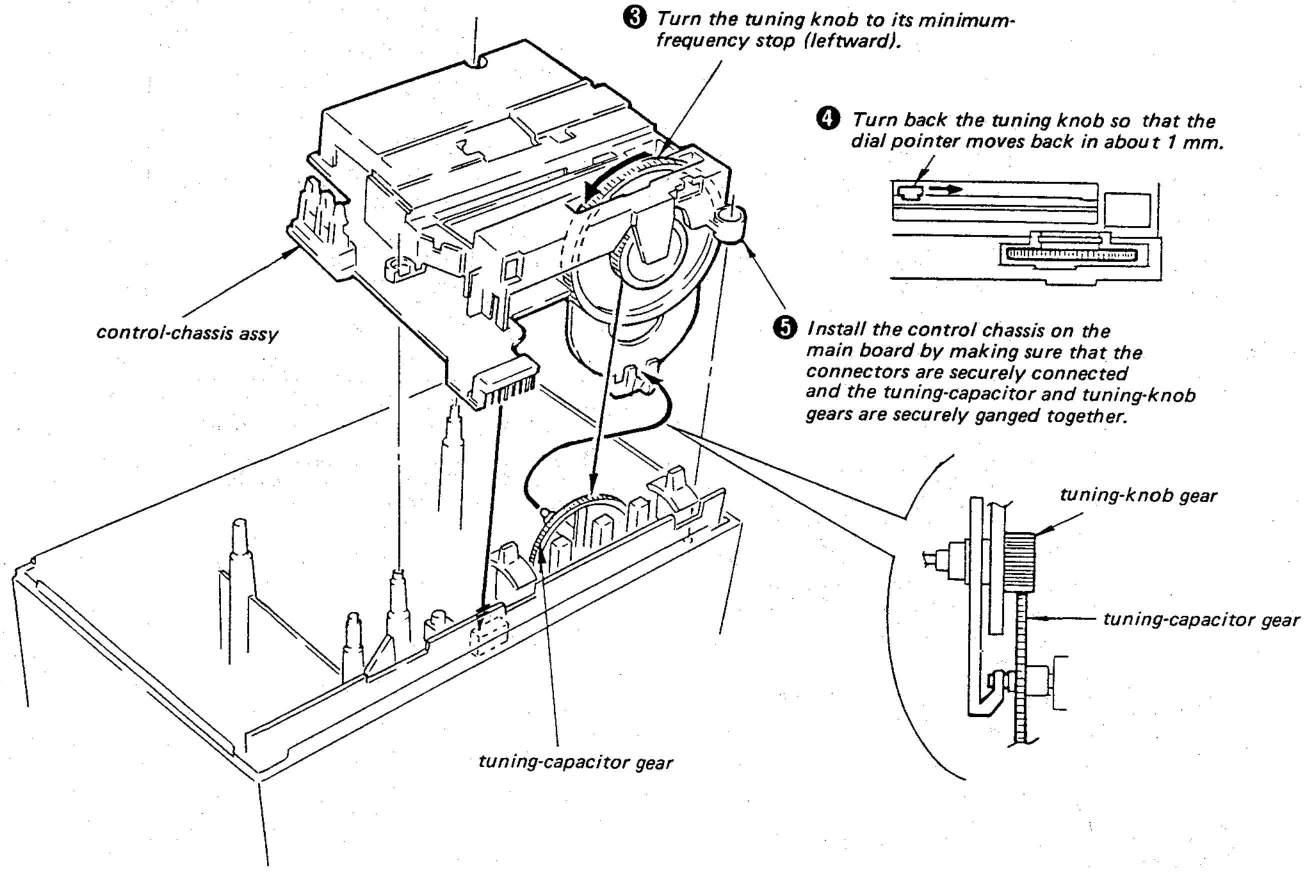
1. Mounting the Tuning-Capacitor Gear



❷ *Orient the widest spoke of the tuning-capacitor gear to the direction as shown by the arrow, and install it on the tuning-capacitor shaft.*

❶ *Turn the tuning-capacitor shaft to its full-counterclockwise stop.*

2. Installation of the Control Chassis



❸ *Turn the tuning knob to its minimum-frequency stop (leftward).*

❹ *Turn back the tuning knob so that the dial pointer moves back in about 1 mm.*

❺ *Install the control chassis on the main board by making sure that the connectors are securely connected and the tuning-capacitor and tuning-knob gears are securely ganged together.*

control-chassis assy
tuning-knob gear
tuning-capacitor gear
tuning-capacitor gear

SECTION 3
ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS
3-1-1. TAPE DECK SECTION

Notes

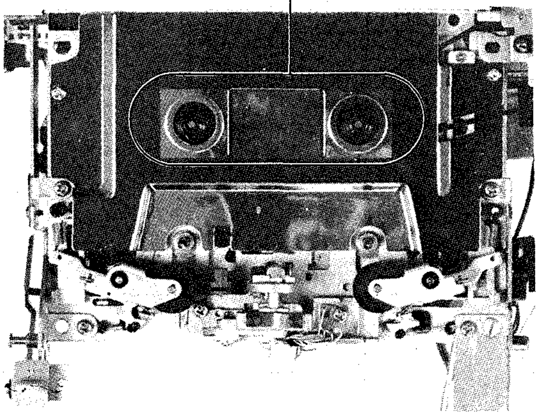
1. Before adjusting, wipe the following parts with a cloth moistened with alcohol.

   Record/playback head — pinch roller
   Erase head
   capstan — rubber belt

2. Degauss the Record/PB/Erase head with a head degausser.
3. Do not use a magnetized screwdriver for adjustments.
4. After adjusting, screw-lock the adjusted parts.
5. Unless otherwise indicated, perform adjustments at specified voltage.

Torque Measurements

Torque	Torque Meter	Measured Value
FWD torque	CQ102C	24 – 55 g·cm (0.33 – 0.76 oz·inch)
FWD back tension torque	CQ102C	2 – 5 g·cm (0.33 – 0.76 oz·inch)
REV torque	CQ102RB	24 – 55 g·cm (0.33 – 0.76 oz·inch)
REV back tension torque	CQ102RB	1.5 – 5 g·cm (0.02 – 0.07 oz·inch)
FF-REW torque	CQ201B	75 – 130 g·cm (1.04 – 1.80 oz·inch)



Note: Perform the Fast-Forward and Rewind torque measurements after operating the set in one cycle of fast-forward → stop → fast-reverse modes.

Tape Path Adjustment

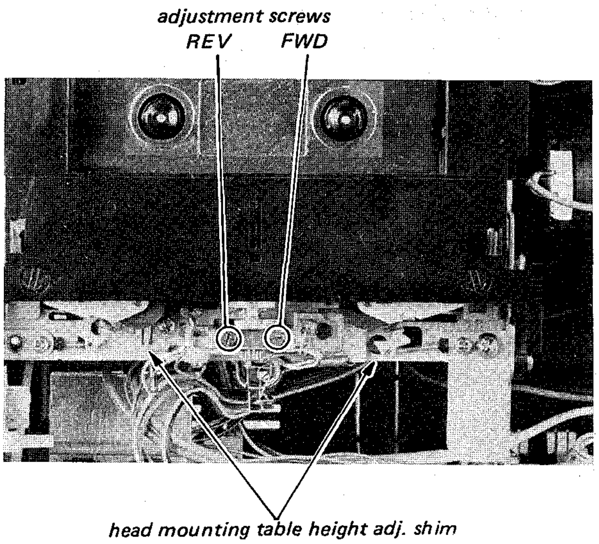
Be sure to perform this adjustment when replacing the record/playback/erase head, or head mounting table assembly.

– PB mode –

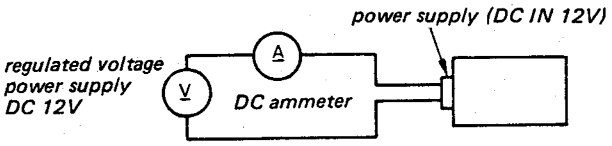
1. Use a mirror cassette and adjust for no tape curl.
2. Change the head mounting table assembly height adjustment shim so that the REC/PB head core position is correct for both FWD/REV without tape curls and twists.

Head Mounting Table Height Adjustment Shim

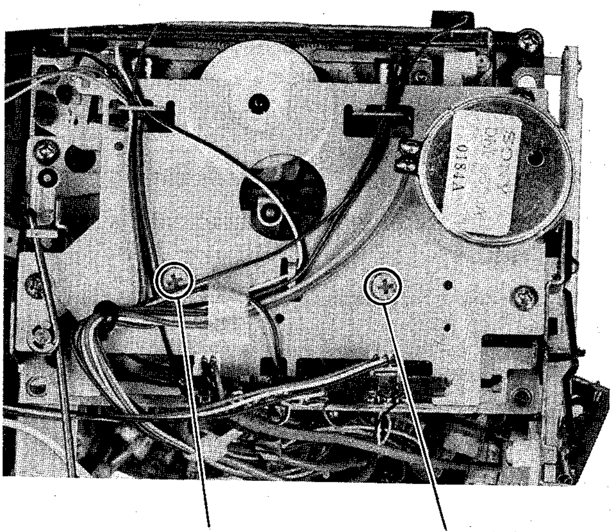
Part No.	thickness
3-313-757-01	0.1 . . . . standard
3-313-757-11	0.15
3-313-757-21	0.2



Thrust Play Adjustment

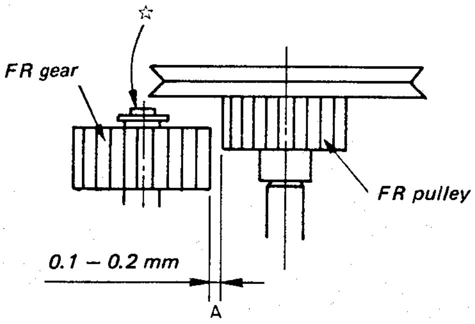

power supply (DC IN 12V)
regulated voltage power supply DC 12V
A
V
DC ammeter

1. Loosen the adjustment screw by turning counter-clockwise.
2. Put the set in FWD mode and turn the adjustment screw clockwise little by little to tighten.
3. Current will increase suddenly at a certain point. Loosen ¼ turn from this point and set.
4. After adjustment, lock the screws.
   Referecne: thrust screw pitch
   0.5mm/1 rotation
   Specification: flywheel · flywheel (R)
   within 0.15 – 0.35mm.


flywheel (L)
flywheel (R)

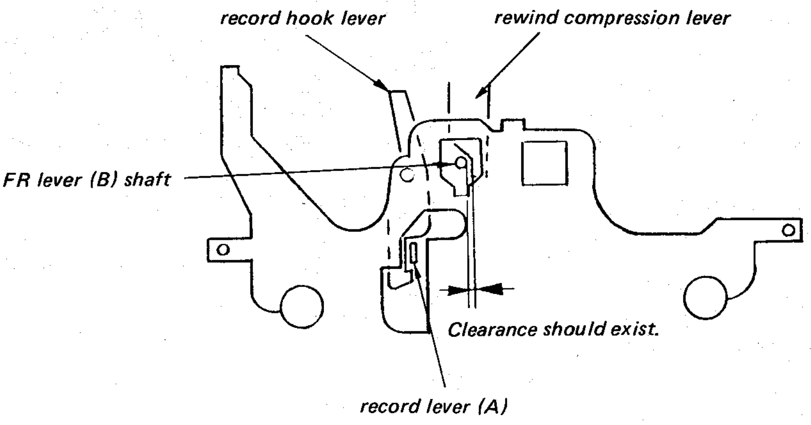
FR Gear Clearance Adjustment

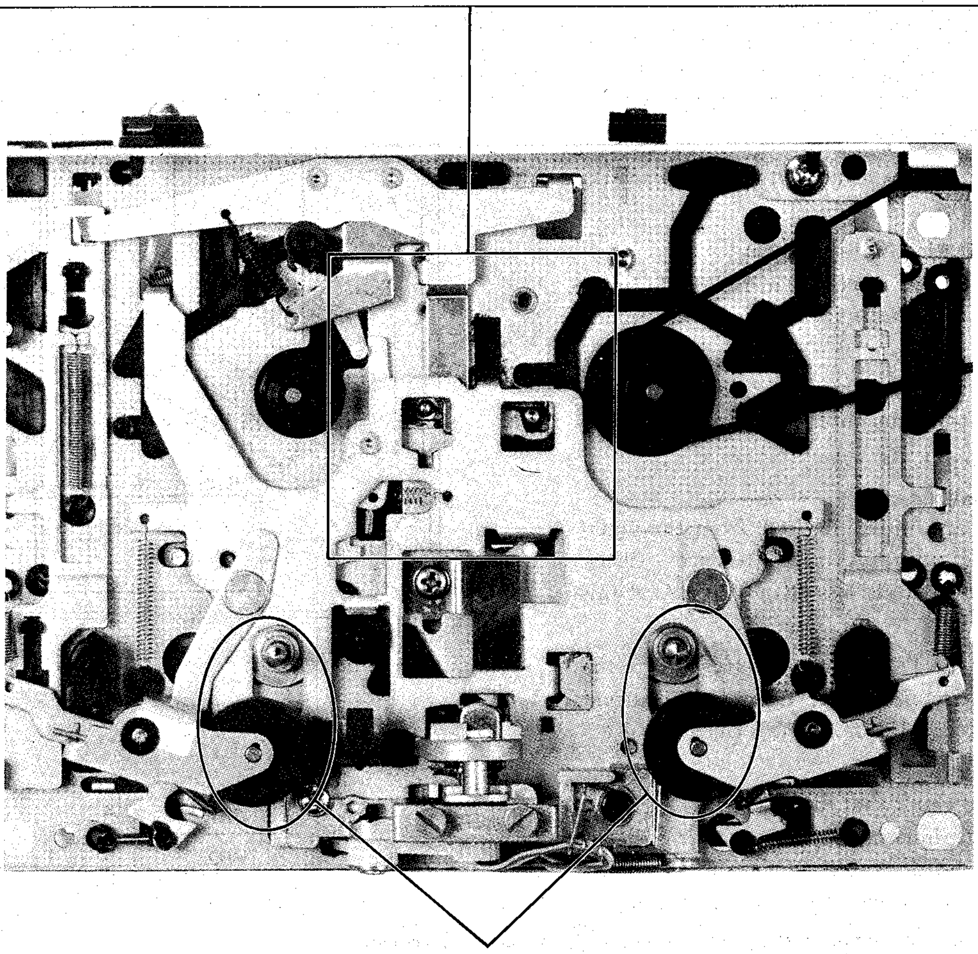
Put the set in STOP mode, and bend the part marked ☆ so that the clearance A is 0.1 – 0.2mm.


☆
FR gear
FR pulley
0.1 – 0.2 mm
A

FR Lever (B) Clearance Adjustment

When the mode is changed from rewind to fast-forward, clearance shoud exist between the FR lever (B) and rewind compression lever as shown below.


record hook lever
rewind compression lever
FR lever (B) shaft
Clearance should exist.
record lever (A)



Clearance should exist between the capstans and pinch rollers in the AMS fast-forward mode both in forward and reverse conditions.

3-1-2. CD Player Section

Backlash Check

Measuring Locations:

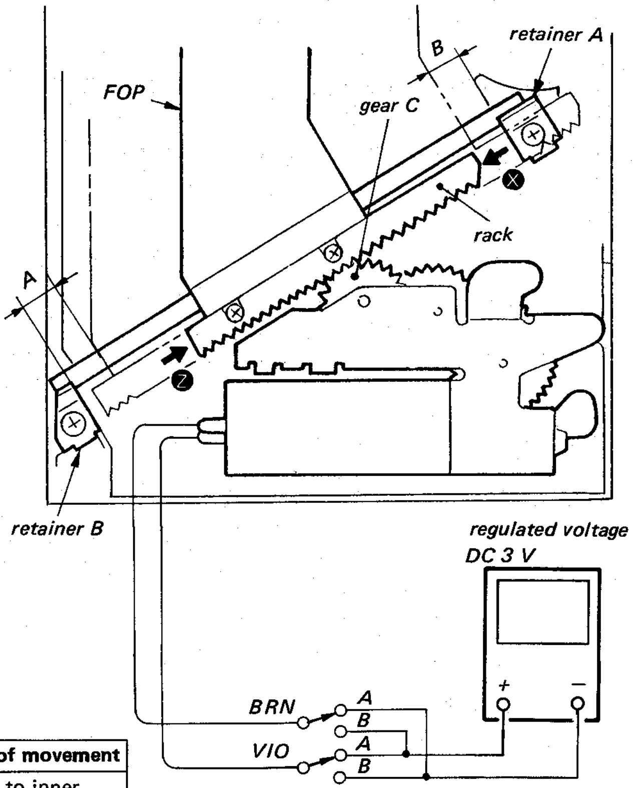
Outer circumference: Where dimension A in the figure at right (space between FOP and retainer B) is 3-5 mm.

Middle circumference: Location where gear C engagement point is at the center of the rack.

Inner circumference: Where dimension B at right (space between FOP and retainer A) is 3-5 mm.

Measuring Procedure:

1. Apply 3 V to sled motor leads and move the FOP to the measuring location.(Refer to figure).
2. At each measuring location, check that there is no movement in the directions of the arrows marked Ⓧ and Ⓩ when 50 g is applied to a fan-shaped tension gauge.
3. If there is movement, sled motor mounting should be redone. (Refer to page 40, Sled Motor Assembly.)



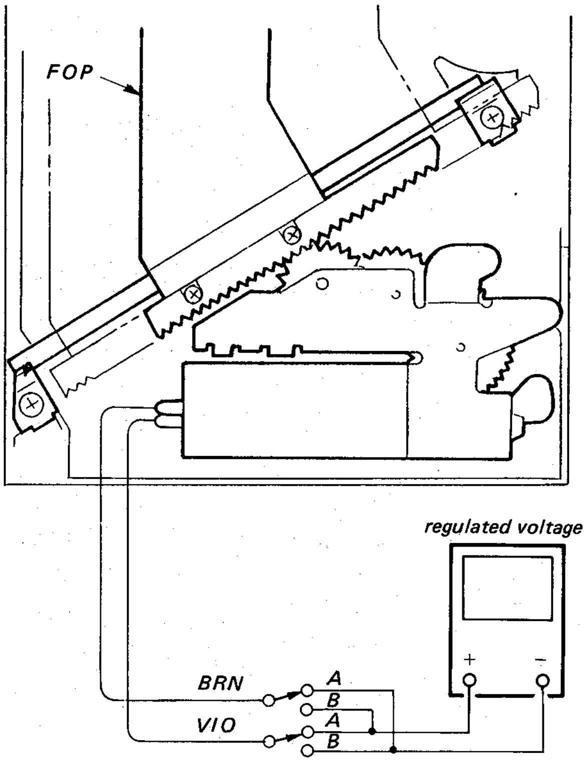
Switch position	Direction of movement	Switch position	Direction of movement
side A	inner to outer circumference	side B	outer to inner circumference

Sled Motor Response Check

If the following check is not satisfied, replace the sled motor (M902).

- **Minimum Activation Voltage Check.**
  1. Apply 1.5 V and check that the FOP moves smoothly from the inner to the outer circumference.
  2. Next apply 2 V and check that the FOP moves smoothly from the outer to the inner circumference.
- **Sledding Current Check**
  1. Apply 3 V and move the FOP from the innermost to the outermost circumference. Check that current value is less than 120 mA at this time.
  2. Next move the FOP from the outermost to the innermost circumference. Check that current value is less than 150 mA at this time.
- **Sledding Time Check**

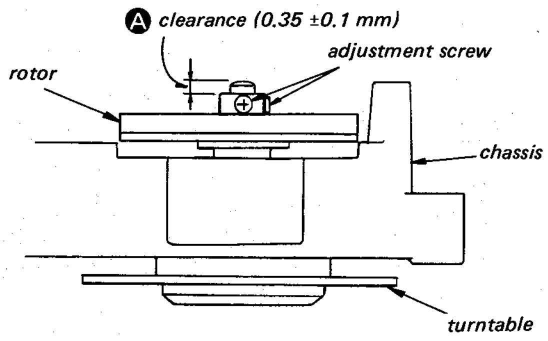
  Apply 3 V, and check that the time for the FOP to move from the innermost to the outermost circumference and from the outermost to the innermost circumference is less than 5 seconds each.



Switch position	Direction of movement	Switch position	Direction of movement
side A	inner to outer circumference	side B	outer to inner circumference

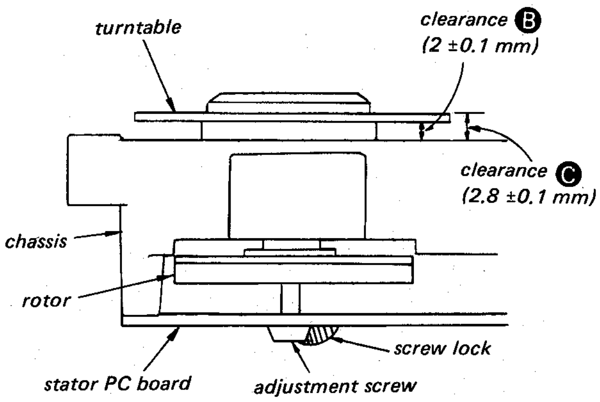
Rotor Mounting, Thrust Adjustment

- **Rotor Mounting**


Ⓐ clearance (0.35 ±0.1 mm)
adjustment screw
rotor
chassis
turntable

Mount the rotor on the turntable shaft so that the clearance A above is 0.35 ±0.1 mm.

- **Thrust Adjustment**


turntable
clearance Ⓑ (2 ±0.1 mm)
clearance Ⓒ (2.8 ±0.1 mm)
chassis
rotor
screw lock
stator PC board
adjustment screw

Adjust the adjustment screw so that clearances Ⓑ and Ⓒ above are as follows:

Ⓑ: 2 ±0.1 mm
Ⓒ: 2.8 ±0.1 mm

Lock the screw after adjustment.

3-2. ELECTRICAL ADJUSTMENTS

3-2-1. TAPE-RECORDER SECTION

1. Perform adjustment in the order given. (As a general rule, perform recording system adjustment after completing playback system adjustment.)
2. Unless otherwise indicated, perform adjustment and measurement for each channel.
3. Switch, control knob positions

   FUNCTION . . . . .TAPE
   TAPE SELECT. . . . . .NORMAL
   DOLBY NR . . . . .OFF
   ISS. 2
   VOLUME . . . . .minimum or required
   GRAPHIC
   EQUALIZER . . . . . . .mechanical center
4. Specified recording position

   Adjust the VOLUME knob to obtain the following specified input/output signal levels.

   Specified input level

Input pin	MIX/MIC	LINE IN
Signal level impedance	300Ω	10kΩ
Input signal level	4.9mV (–44dB)	0.44V (–5dB)

Specified output level

Output pin	SP OUT	LINE OUT
Load impedance	4Ω	47kΩ
Output signal level	0.775V (0dB)	0.28V (–8.9dB)

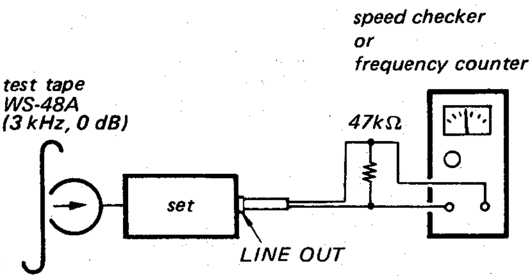
0dB = 0.775V

5. Reinstall the control and button boards and deck mechanism in the connectors on the main board.
6. Refer to the separate sections for adjustments to CD player section.

Tape Speed Adjustment

Procedure:

Mode: forward playback

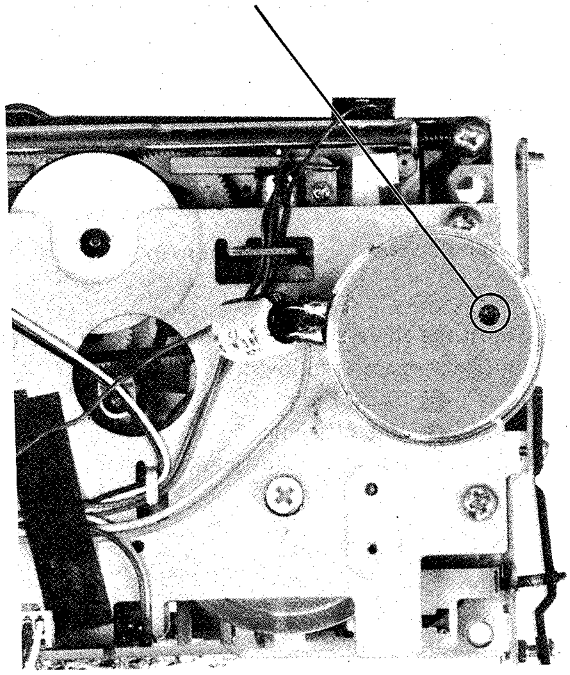


Specification:

3,000 Hz, +90 Hz, –75 Hz

Adjust so that frequency difference at beginning and end of winding is 1% (30Hz).

Adjustment Location: Adjust variable resistor inside motor.
(Insert screwdriver to adjust. Speed increases when turned clockwise.)

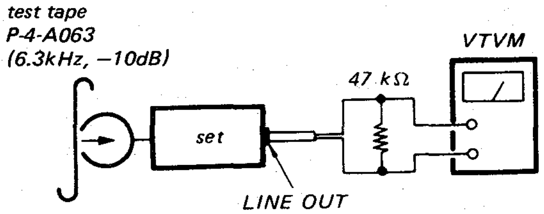


Record/playback Head Azimuth Adjustment

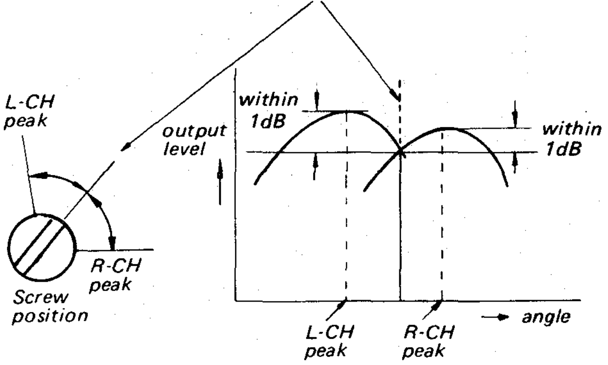
Perform for both forward and reverse playback modes.

Procedure:

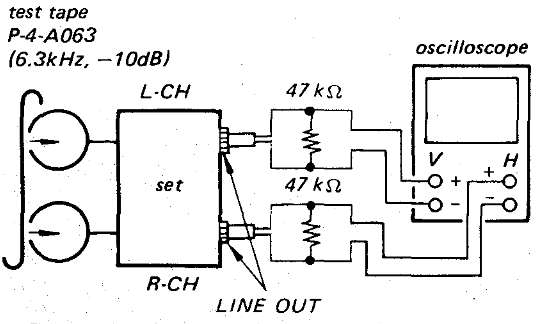
1. Mode: playback

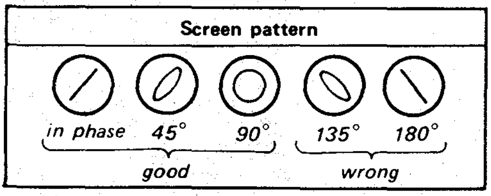

test tape
P-4-A063
(6.3kHz, −10dB)
VTVM
47 kΩ
set
LINE OUT

2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 1dB.

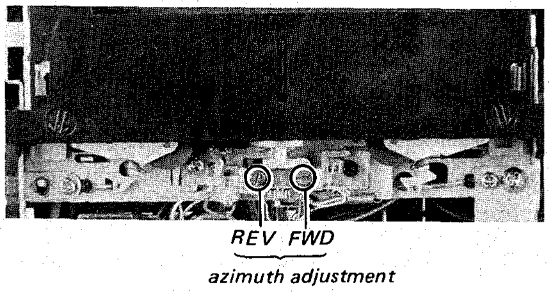

L-CH peak
output level
within 1dB
within 1dB
R-CH peak
Screw position
L-CH peak
R-CH peak
angle

3. Phase Check
   Mode: playback


test tape
P-4-A063
(6.3kHz, −10dB)
oscilloscope
L-CH
47 kΩ
set
47 kΩ
V
H
+
−
+
−
R-CH
LINE OUT


Screen pattern
in phase
45°
90°
135°
180°
good
wrong

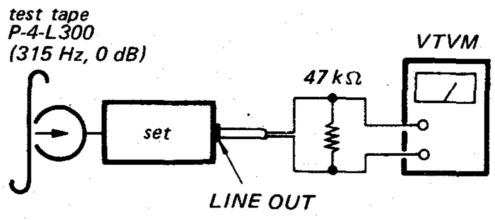
Adjustment Location:


REV
FWD
azimuth adjustment

Playback Level Adjustment

Procedure:

– Playback mode –


test tape
P-4-L300
(315 Hz, 0 dB)
VTVM
47 kΩ
set
LINE OUT

Specification:

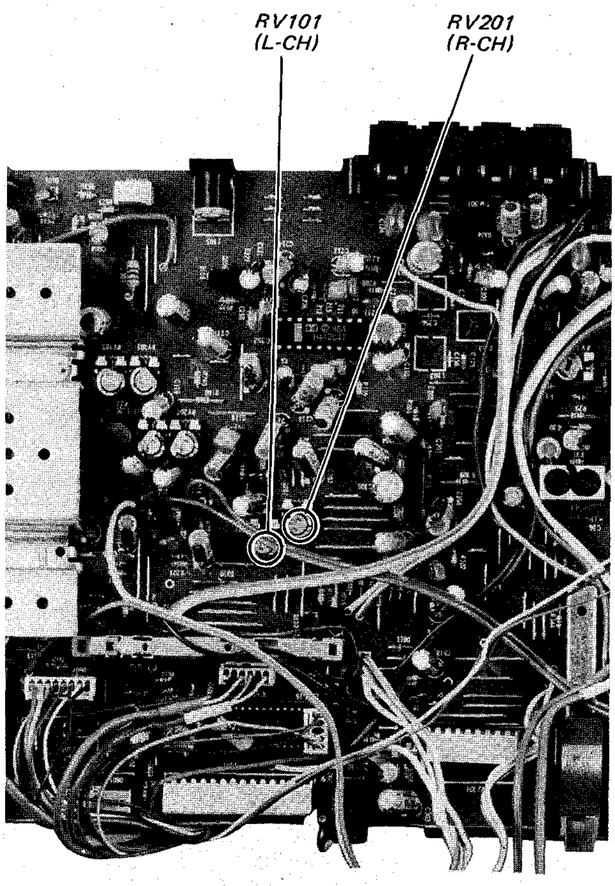
LINE OUT level: 0.28 ± 0.01V (−8.9 ± 0.2dB)

Level difference between channels: within 0.3 dB

Confirm that LINE OUT level does not change when playback, STOP are repeated.

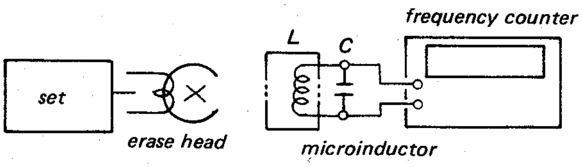
Adjustment Location: Main board

(**Note:** Also accessible through holes in the bottom of rear cabinet.)


RV101
(L-CH)
RV201
(R-CH)

Record Bias Oscillation Frequency Adjustment

Procedure:


frequency counter
L
C
set
erase head
microinductor

Examples of L-C combination:

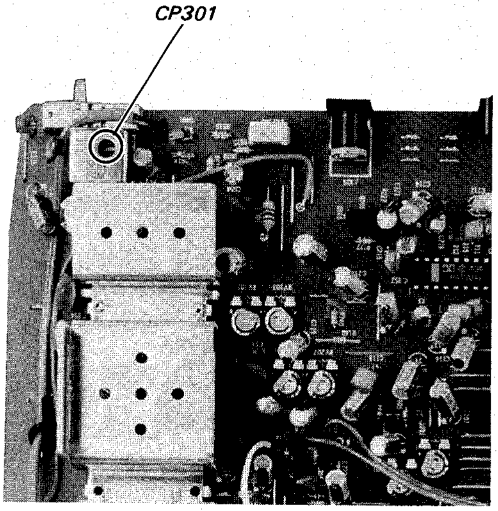
L (microinductor)	C (capacitor)
47μH	0.075μF
56μH	0.062μF
68μH	0.051μF
82μH	0.043μF
100μH	0.036μF
150μH	0.022μF
1mH	0.0036μF

1. Set for no signal recording state.
   Remove cassette lid, close cassette holder, push leaf switches on top of cassette compartment, and push record and play buttons.
2. Bring the microinductor connected to the frequency counter close to the erase head core.
3. Adjust CP301 with the ISS switch set to 2 (normal position) so that frequency becomes in 85.0kHz ±2.0kHz.
4. Change the ISS switch to 1 and 2 and check for the frequencies respectively.

Adjustment Values:

ISS switch 1: 88.0kHz ± 2.0kHz
ISS switch 3: 81.5kHz ± 2.0kHz

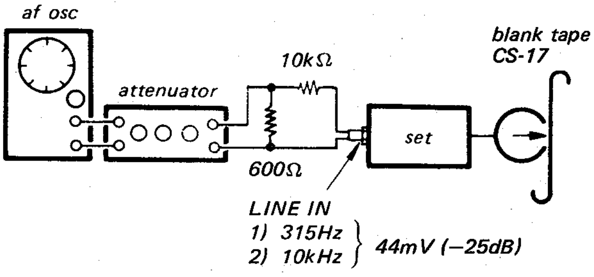
Adjustment Location: Main board



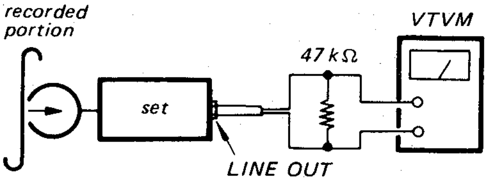
Record Bias Adjustment

Procedure:

1. Mode: record

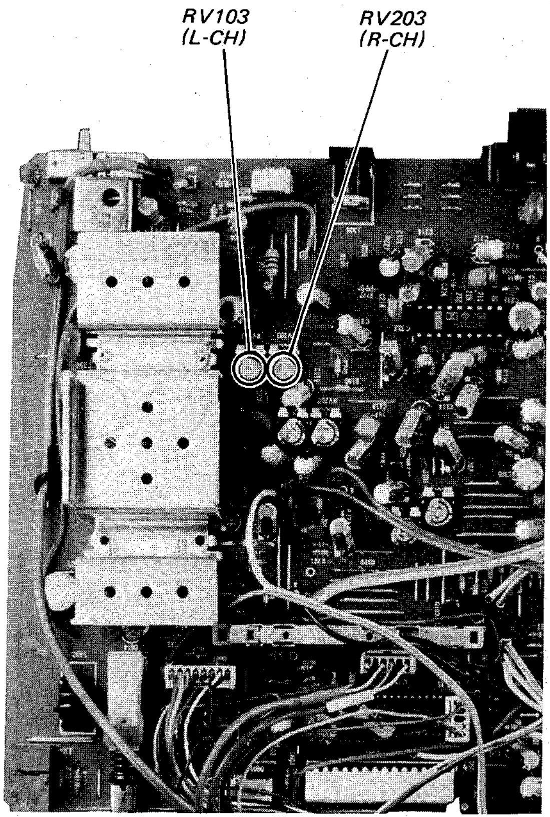

af osc
attenuator
10kΩ
600Ω
set
blank tape
CS-17
LINE IN
1) 315Hz
2) 10kHz
44mV (–25dB)

2. Mode: playback


recorded portion
set
47kΩ
VTVM
LINE OUT

Adjust RV 103 (L-CH) and RV 203 (R-CH) so that the 10kHz playback output difference is –0.2dB ± 0.5dB relative to 315Hz playback output.

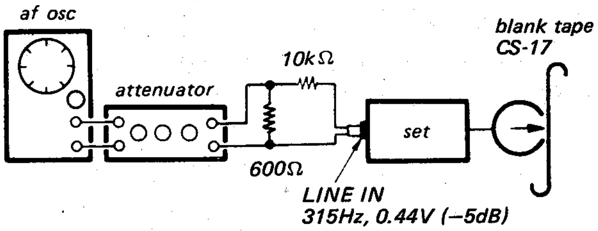
Adjustment Location: Main board
(**Note:** Also accessible through holes in the bottom of rear cabinet.)


RV103
(L-CH)
RV203
(R-CH)

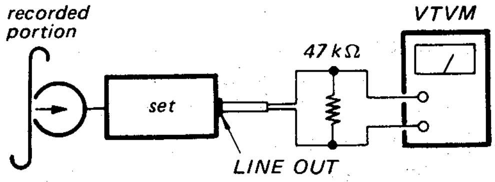
Record Level Adjustment

Procedure:

1. Mode: record


af osc
attenuator
10kΩ
600Ω
set
blank tape
CS-17
LINE IN
315Hz, 0.44V (−5dB)

2. Mode: playback


recorded
portion
VTVM
47kΩ
set
LINE OUT

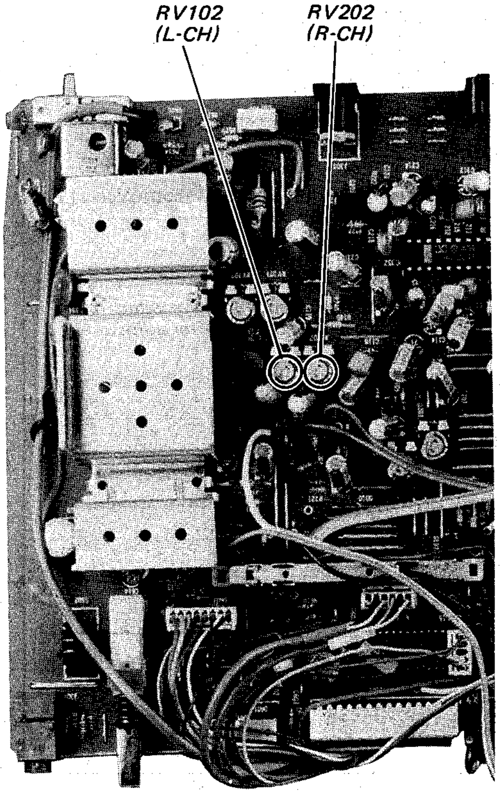
Adjust RV102 (L-CH) and RV202 (R-CH).

3. Repeat steps 1 and 2 several times until no improvement is obtained.

Specification:

LINE OUT level: 0.27 – 0.29V
(−8.9dB ± 0.5dB)

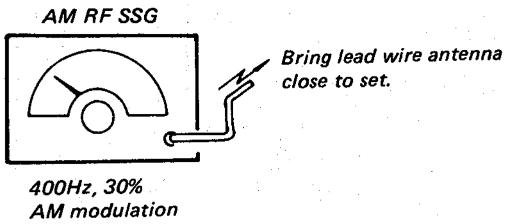
Adjustment Location: Main board
(**Note:** Also accessible through holes in the bottom of rear cabinet.)


RV102
(L-CH)
RV202
(R-CH)

3-2-2. RADIO SECTION

AM SECTION

FUNCTION switch: RADIO
BAND SELECT switch: AM

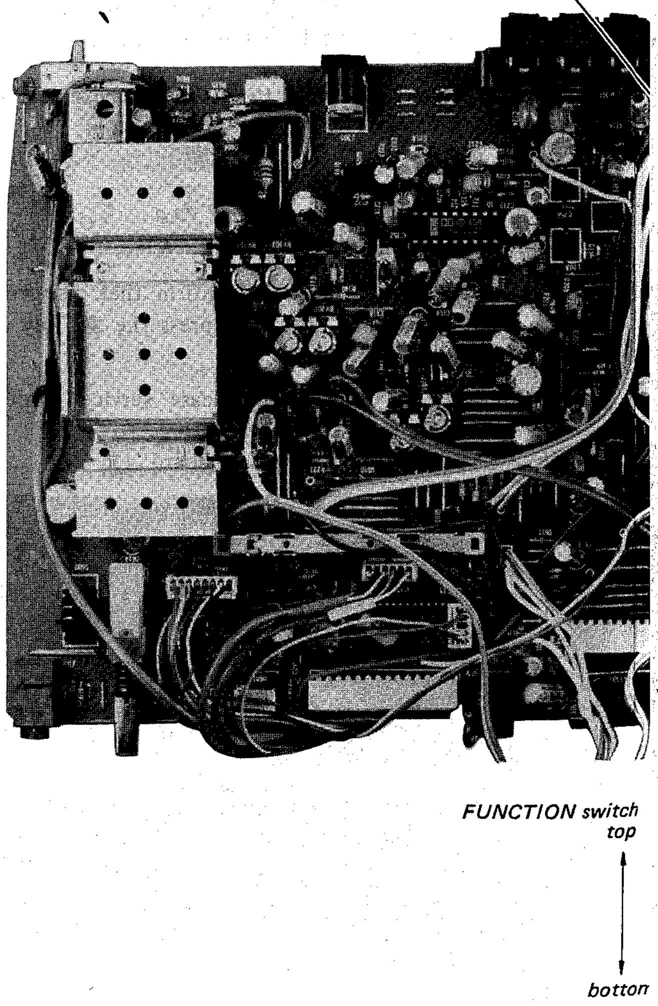

AM RF SSG
Bring lead wire antenna close to set.
400Hz, 30%
AM modulation

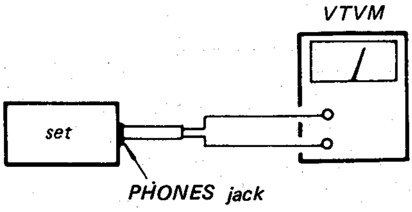
Output: usable lowest possible

- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

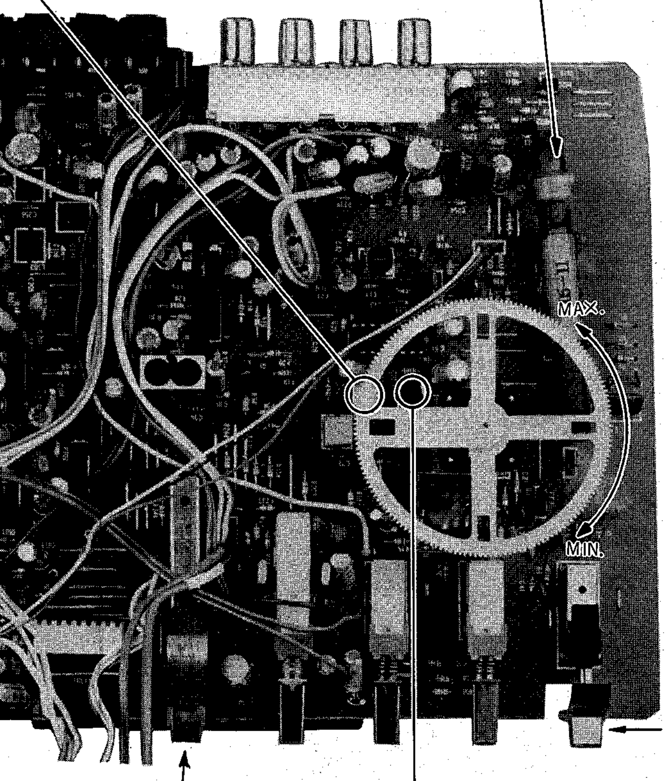
AM IF ALIGNMENT	
Adjust for maximum reading on VTVM.	
455kHz	T3

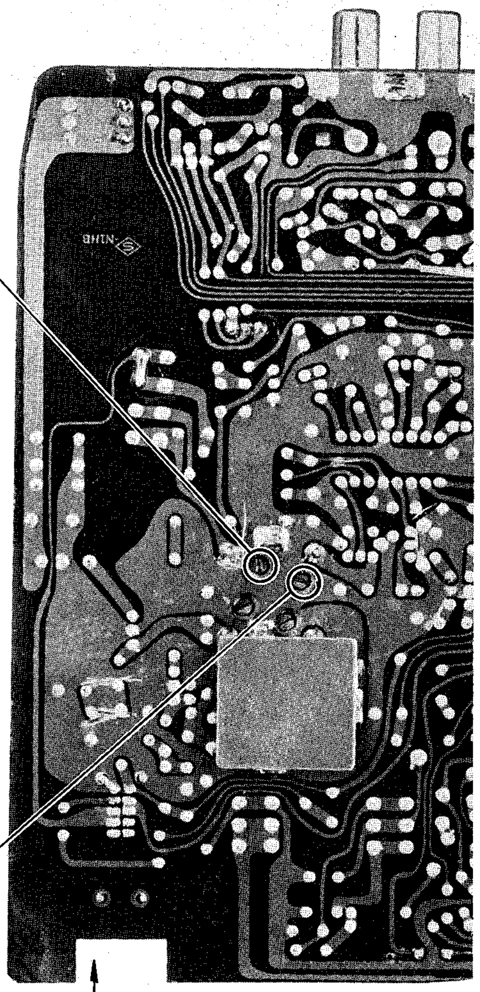
[AM]


FUNCTION switch
top
botton


VTVM
set
PHONES jack

AM TRACKING ADJUSTMENT	
Adjust for maximum reading on VTVM.	
620kHz	1,400kHz
L4	CT3

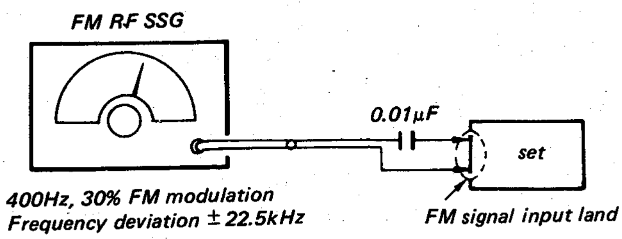

MAX.
MIN.
BAND SELECT switch
top : FM STEREO
center : FM MONO
bottom : AM
ON switch
top
bottom : TAPE
switch
CD
LINE IN
RADIO

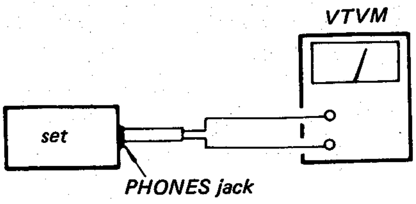

BAND SELECT switch
top : AM
center : FM MONO
bottom : FM STEREO

T2	CT4
520kHz	1,680kHz
tuning capacitor MAX. (f min)	tuning capacitor MIN. (f max)
Adjust for maximum reading on VTVM.	
AM FREQUENCY COVERAGE ADJUSTMENT	

FM SECTION

FUNCTION switch: RADIO
BAND SELECT switch: FM MONO or FM STEREO

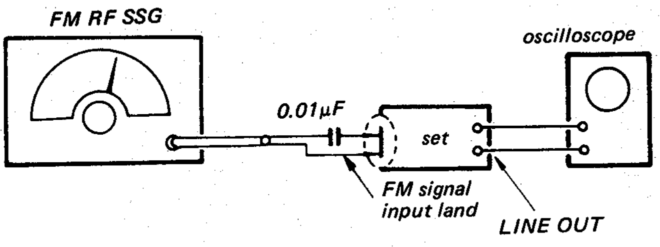

FM RF SSG
0.01μF
set
400Hz, 30% FM modulation
Frequency deviation ±22.5kHz
FM signal input land


VTVM
set
PHONES jack

- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

FM Discriminator Adjustment

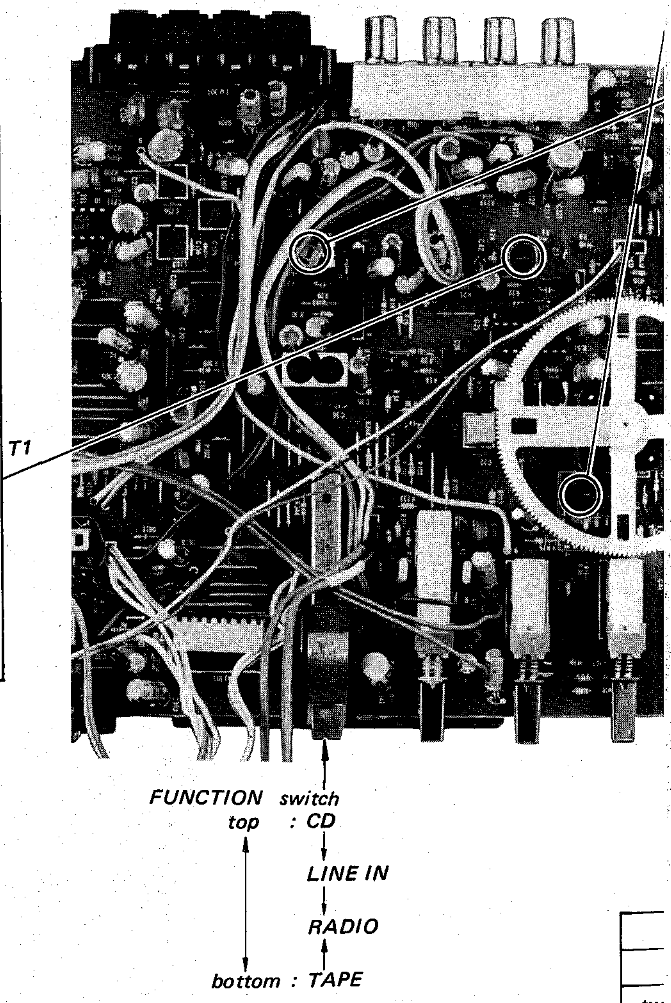
Procedure:


FM RF SSG
oscilloscope
0.01μF
set
FM signal input land
LINE OUT

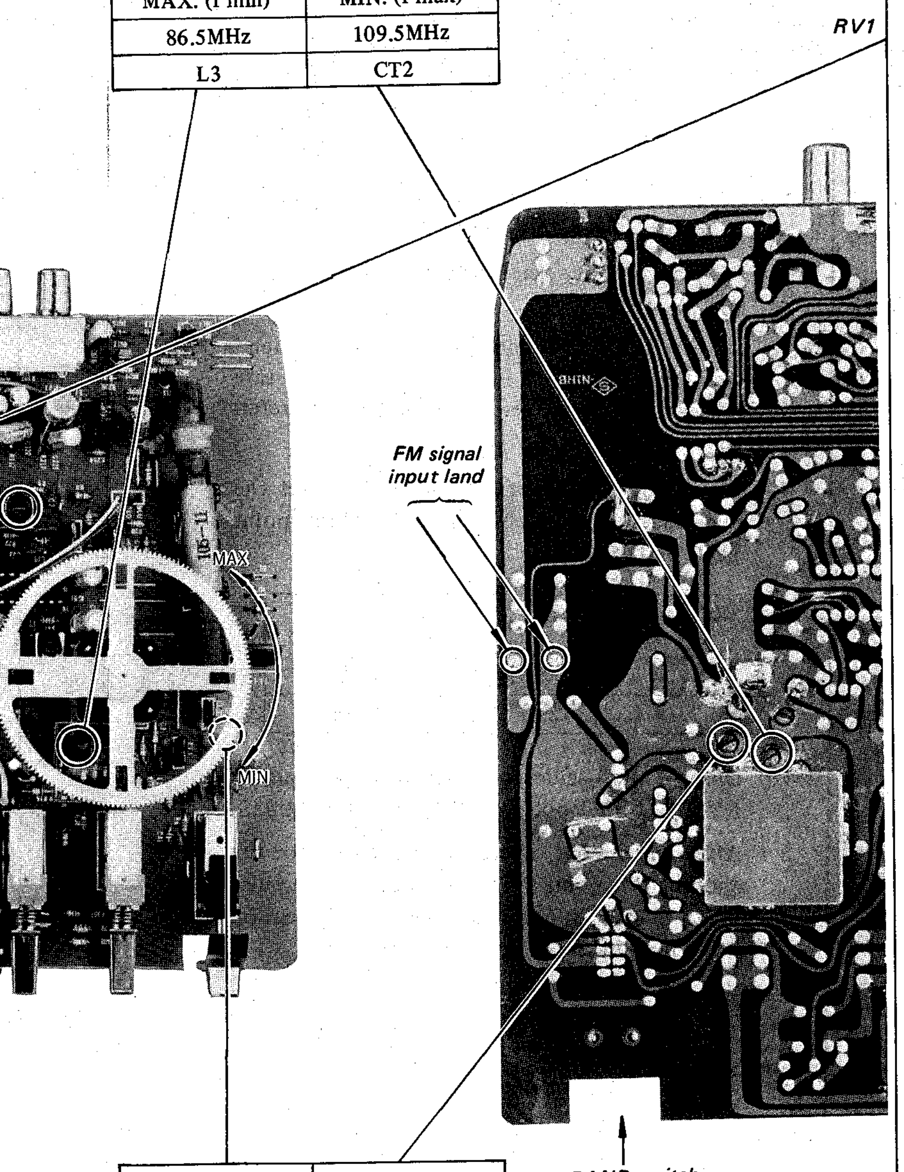
Carrier frequency: *98MHz*
Modulation: *1kHz, 25kHz deviation (100%)*
Output Level: *1mV (60dB)*
Mode: *monaural*

1. Tune to 98MHz.
2. Adjust T1 so that the top and bottom of the waveform are symmetrical.

【FM】


T1
FUNCTION switch
top : CD
LINE IN
RADIO
bottom : TAPE

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for maximum reading on VTVM.	
tuning capacitor MAX. (f min)	tuning capacitor MIN. (f max)
86.5MHz	109.5MHz
L3	CT2


RV1
FM signal input land
MAX
MIN

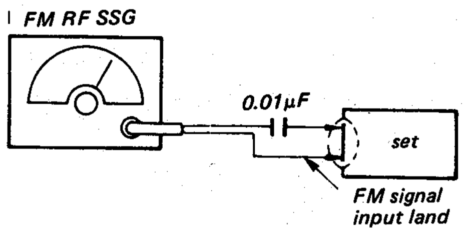
BAND switch
top : AM
center : FM MONO
bottom : FM STEREO

L1	CT1
86.5MHz	109.5MHZ
tuning capacitor MAX. (f min)	tuning capacitor MIN.(f max.)
Adjust for maximum reading on VTVM.	
FM TRACKING ADJUSTMENT	

VCO Adjustment

A) Regular Method

Procedure:


FM RF SSG
0.01μF
set
FM signal input land

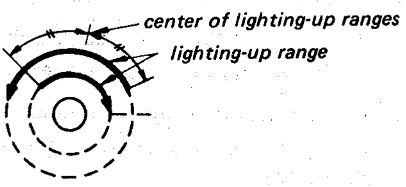
Carrie frequency: *98MHz*
Modulation: *demodulated*
Output level: *1mV (60dB)*

1. Tune to 98MHz.
2. Adjust RV1 so that the frequency counter reading is 38kHz ±0.1kHz

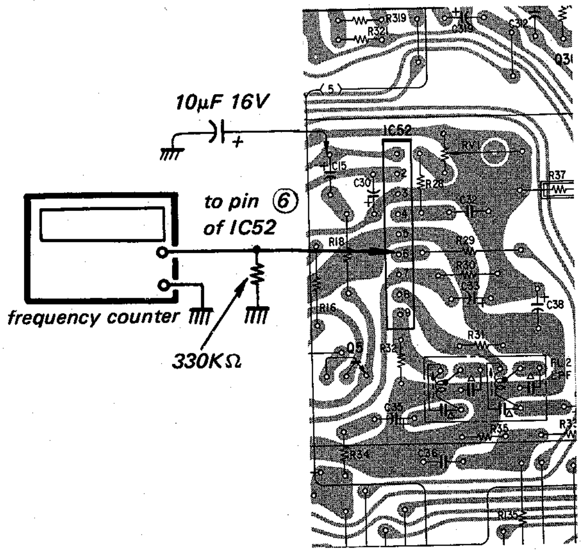
B) Simple Method

Procedure:

1. Receive an FM stereo broadcast.
2. Turn RV1 left and right, and set it at the center of overlapping **FM STEREO** lamp lighting-up ranges.


center of lighting-up ranges
lighting-up range

Adjustment Location: Main board


10μF 16V
to pin ⑥ of IC52
frequency counter
330KΩ
IC52
RV1

3-2-3. CD Player Section

Notes on Adjustment

1. Perform adjustments in service mode.
   Be sure to release service mode after completing adjustment.
2. Perform adjustments in the order given.
3. Use test disc YEDS-1, but only when disc use is indicated.
4. Power supply voltage: DC 9 V
   Power switch: ON

PREPARATION

Put the set into service mode (See pages 10 to 16) and perform the following checks. Repair if there are any abnormalities.

- **Sled Motor Check**

1. Press the OPEN button and open the top panel.
2. Press the ▶▶|, |◀◀ keys and make sure that the FOP moves smoothly, without catching, from the inmost → outmost → inmost circumference.
   ▶▶|: FOP moves outward
   |◀◀: FOP moves inward

- **Focus Search Check**

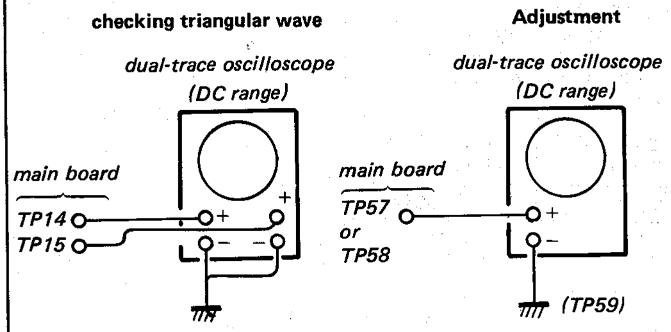
1. Press the OPEN button and open the top panel.
2. Press the ▶❚❚ key. Focus search is performed continuously. Laser does not emit.
3. Observe the FOP objective lens and check that it moves smoothly up and down with no catching or noises.
4. Press the ■ key.
   Check that focus search operation stops. If it does not, press the ■ key again, longer.

TRIANGULAR WAVE ADJUSTMENT

Conditions:

Set the ground levels of dual-trace oscilloscope CH1 and CH2 so that they are on the 0V center line.

Adjustment Method:



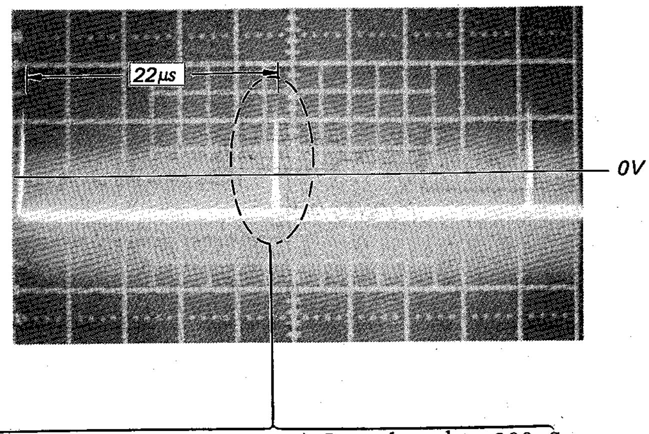
1. Connect the dual-trace oscilloscope to main board test points TP14 and TP15.
2. Put the set into service mode (refer to pages 10-14).
3. Observe the oscilloscope waveform and remember if offset voltage is off on the + or – side relative to 0 V. (Refer to triangular wave reference waveform).
4. Depending on the offset voltage, connect the dual-trace oscilloscope to main board test point TP57 or TP58.

Offset voltage difference	Connection
–	TP 58 (IC507 ①)
+	TP 57 (IC507 ④)

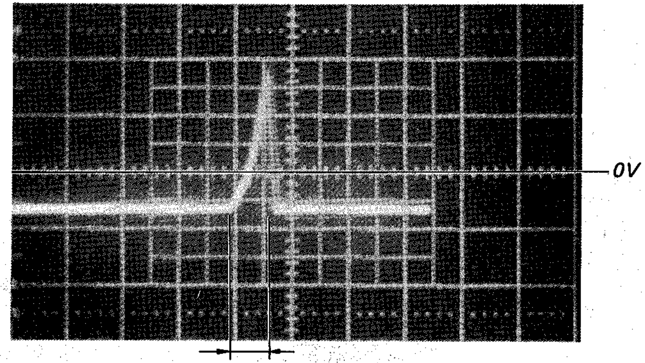
5. Observe the oscilloscope waveform, and adjust RV503 so that pulse width is less than 200nS.
6. After adjustment, check the waveform for the another test point (TP57 or TP58). If the pulse width is over 200nS, the test point connection was wrong in step 4. Repeat steps after 4.

- **Waveform for reference**

VOLT/DIV: 1 V *TIME/DIV: 5 µS*



Pulse waveform with TIME/DIV enlarged to 200nS.

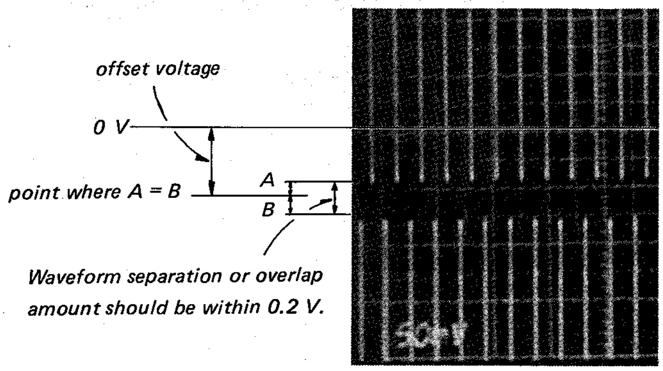


Adjust this width to less than 200nS.

7. Connect the dual-trace oscilloscope as in step 1 and confirm that the triangular wave separation or overlap amount is within 0.2 V.

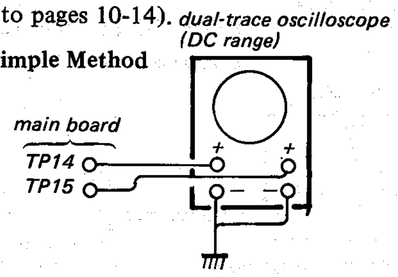
- **Triangular wave reference waveform** (shows offset voltage off in one direction) VOLT/DIV: 50 mV TIME/DIV: 50 µS

upper: TP14 (IC504 ⑤, ⑪)
lower: TP15 (IC504 ⑥, ⑧)


offset voltage
0 V
point where A = B
A
B
Waveform separation or overlap amount should be within 0.2 V.
50mV

8. After adjustment, release service mode. (Refer to pages 10-14).

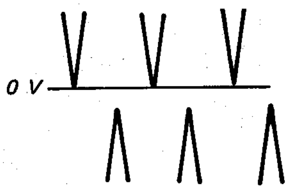
B) Simple Method


dual-trace oscilloscope
(DC range)
main board
TP14
TP15
+
+
−
−

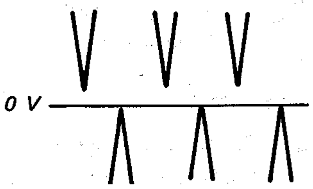
1. Connect the dual-trace oscilloscope to main board test points TP14 and TP15.
2. Put the set into service mode (refer to pages 10-14).
3. Observe the oscilloscope waveform and confirm if offset voltage is off on the + or − side relative to 0 V. (Refer to triangular wave reference waveform).
4. Depending on the offset voltage, adjust RV503 so that the tips of triangular wave are 0 V as fig. Ⓐ and Ⓑ below.

- **Waveform for adjustment**

Ⓐ When offset voltage is off in − direction. (Adjust that the upper tips of waveform are 0 V.)



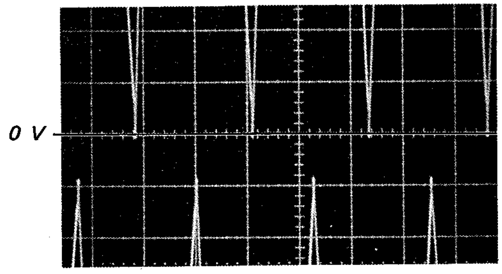
Ⓑ When offset voltage is off in + direction. (Adjust that the lower tips of waveform are 0 V.)



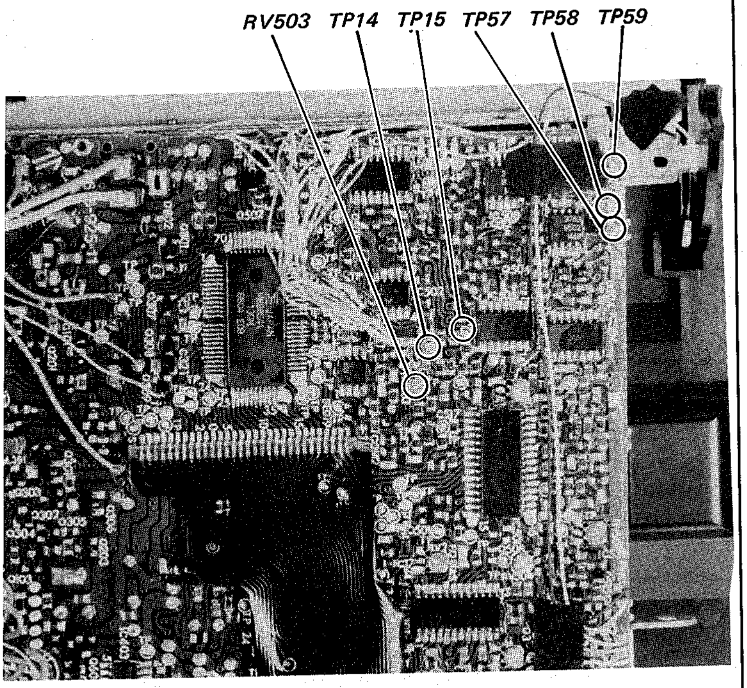
5. After adjustment, release service mode (See page 10-14).

- **Waveform for reference**

(Offset voltage is off in − direction)
upper: TP14 (IC504 ⑤, ⑪) VOLT/DIV: 100 mV
lower: TP15 (IC504 ⑥, ⑧) TIME/DIV: 10 µS



Check/Adjustment Location: Main board

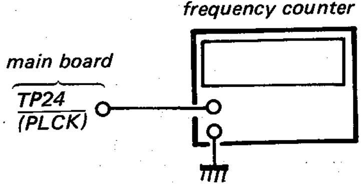

RV503
TP14
TP15
TP57
TP58
TP59

Note: TP57 when offset voltage is off in + direction.
TP58 when offset voltage is off in – direction.
TP59 (GND)

PLL FREE RUN FREQUENCY CHECK AND ADJUSTMENT

Note: Be sure to perform this when the DC-DC converter is replaced.

Check/Adjustment Procedure

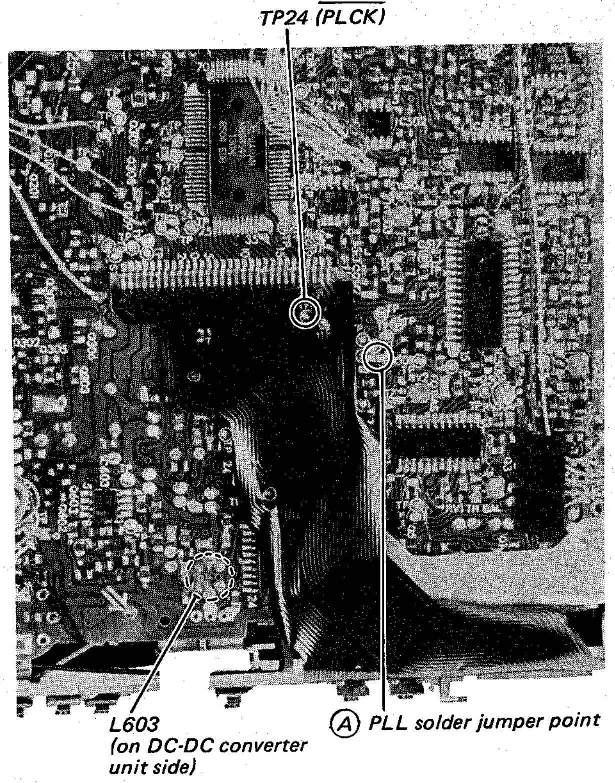

frequency counter
main board
TP24
(PLCK)

1. Short the jumper point Ⓐ (PLL) in the diagram below.
2. Connect a frequency counter to main board test point TP24 ($\overline{\text{PLCK}}$).
3. Put the set into service mode (see page 10-14).
4. Check that the frequency counter reading is 4.3218 ±0.04 MHz. If not, adjust L603 so that it is 4.3218 ±0.01 MHz.
5. After adjustment, release service mode (see page 14).
6. Disconnect the jumper point shorted in step 1.

Check/Adjustment Location: Main board

L603 (on DC-DC converter unit side)

PLL solder jumper point (Short for checking and adjustment. Disconnect after checking and adjustment.

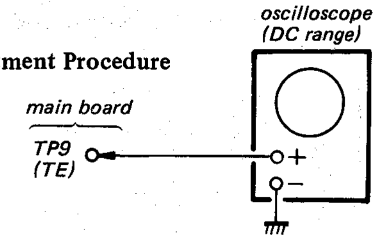

TP24 (PLCK)
L603
(on DC-DC converter
unit side)
Ⓐ PLL solder jumper point

TRACKING BALANCE ADJUSTMENT

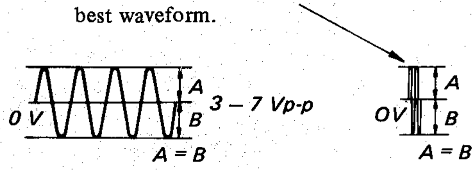
Conditions

The set should be placed either vertically or horizontally.

Adjustment Procedure

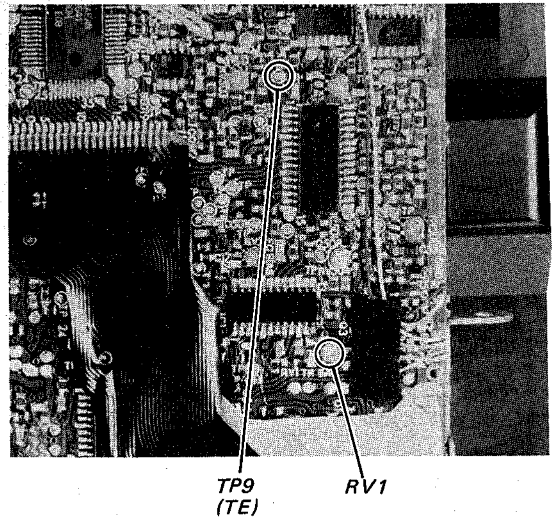

oscilloscope
(DC range)
main board
TP9
(TE)
+
−

1. Connect the oscilloscope to main board TP9 (TE).
2. Put the set into service mode (see page 10-14).
3. Press the ▶▶| and |◀◀ keys to move the FOP to the center.
4. Insert the disc (YEDS-1) and close the top panel.
5. Press the ▶❚❚ key.
   (It will go from focus search to focus ON, and then CLV pull-in mode state. Tracking and sled are OFF.)
6. Adjust RV1 so that the oscilloscope waveform is symmetrical on the top and bottom in relation to 0 V.
   Note: Take sweep time as long as possible to obtain best waveform.


A
0 V
B
3 – 7 Vp-p
A = B
A
OV
B
A = B

7. Press the ■ key. Confirm that disc rotation stops. If it does not, press the ■ key again, longer.
8. After adjustment, release service mode (see page 10-14).

Adjustment Location: main board



SLED MOTOR OFFSET CHECK AND ADJUSTMENT

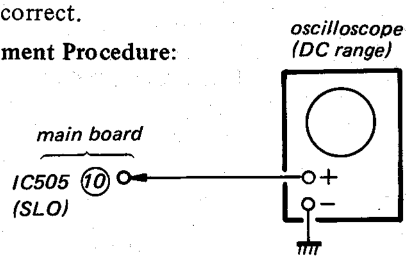
Conditions

Tracking balance adjustment should have been finished.

Close the top panel.

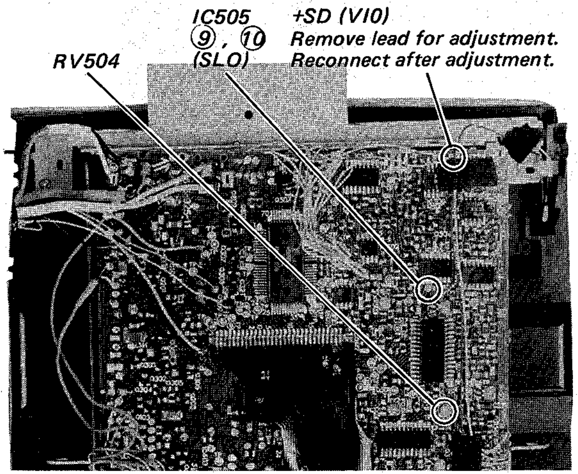
(If the top panel is left open, natural light will enter through the FOP objective lens, and adjustment will not be correct.)

Adjustment Procedure:


oscilloscope
(DC range)
main board
IC505 ⑩
(SLO)
+
−

1. Remove the sled motor +SD lead. (In this adjustment, DC voltage is applied to the tracking amp inside IC501, so this prevents the sled motor from running at abnormal-high speed if RV504 is adjusted too far to the + or – side.)
2. Connect the oscilloscope to main board IC505 pin ⑩ (SLO).
3. Put the set into service mode (see page 10-14).
4. Press the MODE button (tracking and sled go ON).
5. Press the ▶❚❚ key. (focus goes on).
   (This should be made after step 4.)
6. Adjust RV504 so that the oscilloscope reading is 0 ±0.05 V.
7. Press the ■ key.
   Confirm that focus search operation stops. If not, press the ■ key again, longer.
8. After adjustment, release service mode (see page 10-14).
9. Reconnect the sled motor lead removed in step 1.

Adjustment Location: main board.

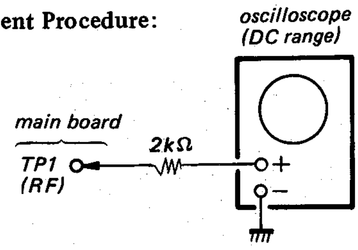

IC505
⑨, ⑩
(SLO)
+SD (VIO)
Remove lead for adjustment.
Reconnect after adjustment.
RV504

FOCUS BIAS ADJUSTMENT

Conditions

The set should be placed either vertically or horizontally.

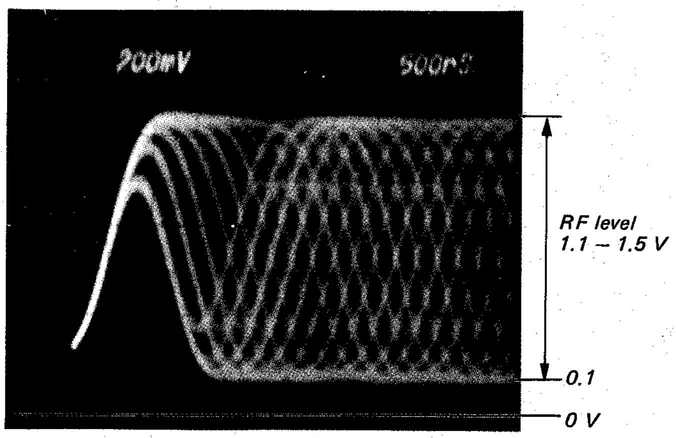
Adjustment Procedure:



1. Put the set into service mode (see pages 10-14).
2. Connect the oscilloscope to main board test point TP1 (RF) through a 2kΩ resistor.
3. Press the ▶▶| and |◀◀ keys to move the FOP to the center. (Move the FOP to the music area on the disc to enable easy visibility of the eye pattern).
4. Put the disc (YEDS-1) on and close the top panel.
5. Press the ▶▮▮ key.
   (It will go from focus search to focus ON, and CLV pull-in mode state. Tracking and sled are OFF).
6. Press the MODE button. (Tracking and sled go ON).
7. Adjust RV2 so that the oscilloscope waveform eye pattern is good. A good eye pattern means that the diamond shape (◇) in the center of the waveform can be clearly distinguished.

- **RF Signal Reference Waveform (eye pattern)**

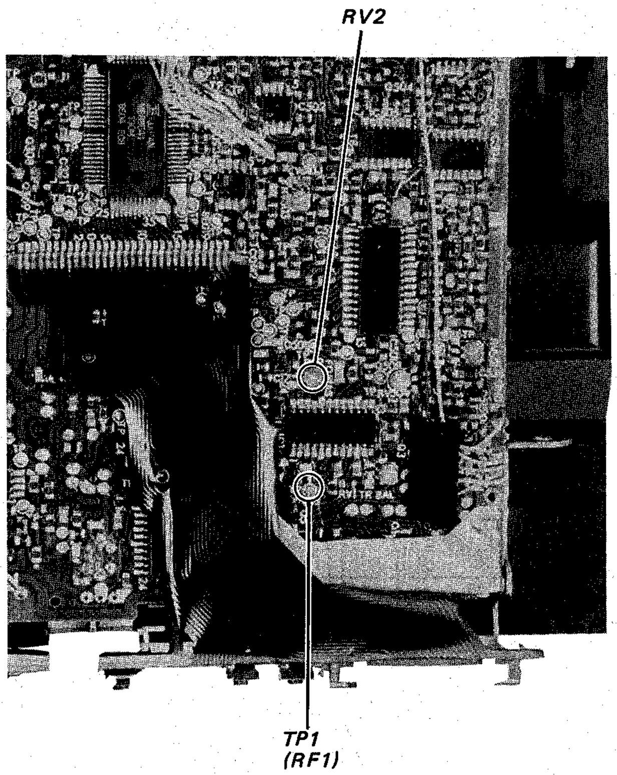
VOLT/DIV: 200 mV
TIME/DIV: 500 nS



When observing the eye pattern, set the oscilloscope for AC range and raise vertical sensitivity.

8. Press the ■ key. Confirm that disc rotation stops. If not, press the ■ key again, longer.
9. After adjustment, release service mode (see page 10-12).

Adjustment Location: main board



FOCUS/TRACKING GAIN ADJUSTMENT

Focus/tracking gain determines the pick-up trackability (vertical and horizontal) relative to mechanical noise and mechanical shock when the 2-axis device operates.
However, as these reciprocate, the adjustment is at the point where both are satisfied.

- When gain is high, the noise when the 2-axis device operates increases.
- When gain is low, it is more susceptible to mechanical shock and skipping occurs more easily.

This adjustment is to be performed when the following parts are replaced.
FOP, RV501 (focus gain control), RV502 (tracking gain control).

Adjustment Method:
– Focus Gain Adjustment –
This adjustment is not to be performed.
If the focus gain control RV501 is turned, set it to mechanical center (see Fig. 6).

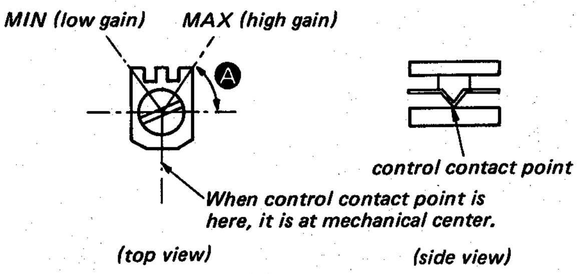
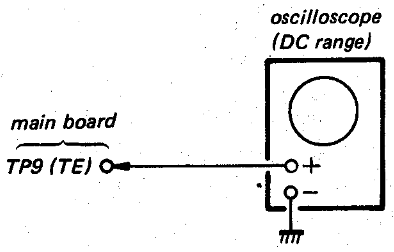


Fig. 6 Mechanical Center (seen from chip mounted side)

– Tracking Gain Adjustment –
(perform at normal operation)



1. Place the set level, horizontally (upper panel can be facing down). If the set is not level, the 2-axis device will be weighted and adjustment cannot be done.
2. Connect the oscilloscope to main board test point TP9 (TE).
3. Turn the power switch on, put the disc on (YEDS-1) and press the ▶■ key.
4. Turn RV502 slightly clockwise (tracking gain drops) and obtain a waveform with a fundamental wave (waveform has large waves) as in Figure 7.
5. Turn RV502 slowly counterclockwise (tracking gain rises) until the fundamental wave disappears (no large waves) as in Figure 8.
6. Set RV502 to the position about 30° counterclockwise from the position obtained in step 5. If RV502 contact point location is within the range shown in Figure 6 Ⓐ , tracking gain is too high. In this case, readjust from step 4.
7. Select AMS mode with the MODE button, continuously press ▶▶| or |◀◀ key and observe the 100 track jump waveform. Check that no traverse waveform appears for both ▶▶| and |◀◀ directions. (See Figures 9 and 10.) It is acceptable if the traverse waveform appears only now and then, but if it appears constantly, raise tracking gain slightly and check step 7 again.
8. Check that there is not an abnormal amount of operation noise (white noise) from the 2-axis device. If there is, tracking gain is too high, so readjust starting with step 4.

The waveforms are those measured with the oscilloscope set as shown below.
VOLT/DIV: 1 V
TIME/DIV: 5 mV

- Waveform when tracking gain is lowered.
  Fundamental wave appears (large waves).

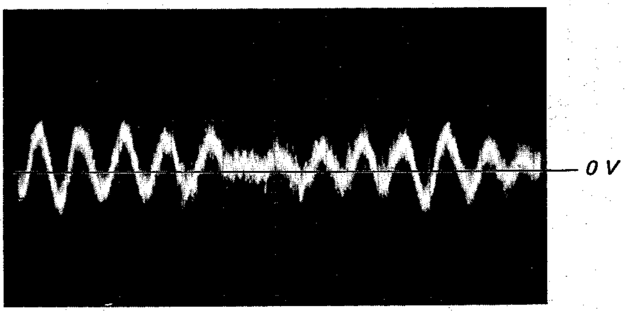


Fig. 7

- Waveform when fundamental wave disappears (no large waves).

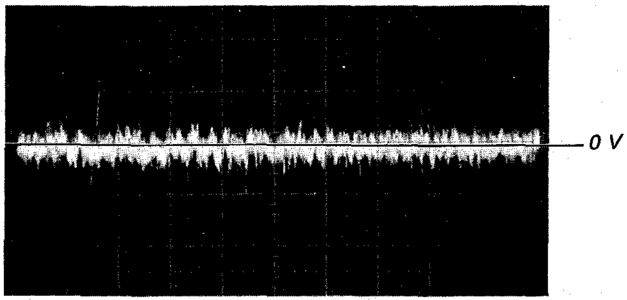


Fig. 8

- Waveform with no traverse waveform during 100 track jump. (Brake operation is smooth and good because of best adjustment).

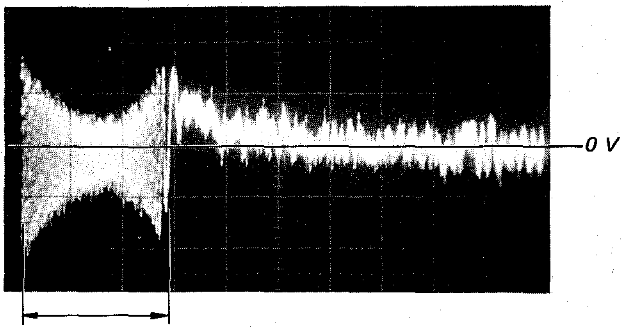


Fig. 9

- Waveform with traverse waveform during 100 track jump. (Brake operation is poor because of low tracking gain.)

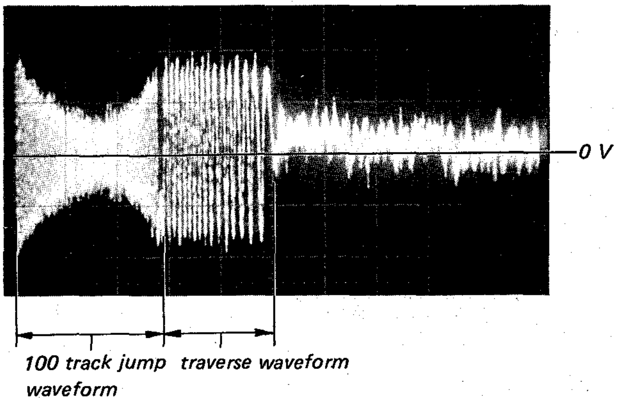
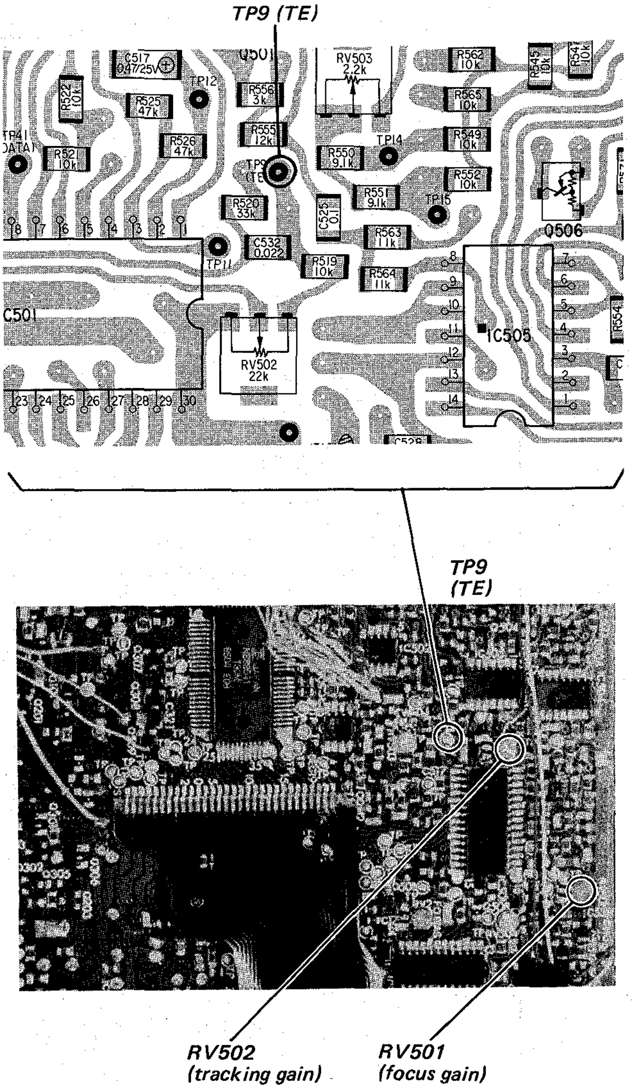


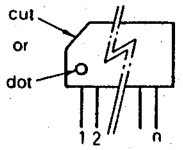
Fig. 10

Adjustment Location: main board

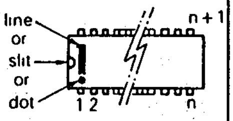

TP9 (TE)
C517 0.47/25V
Q501
RV503 2.2k
R562 10k
R545
R547 10k
R522 10k
R525 47k
TP12
R556 3k
R565 10k
R549 10k
TP41 (DATA)
R521 10k
R526 47k
R555 12k
TP9 (TE)
R550 9.1k
TP14
R552 10k
R520 33k
C525 0.1
R551 9.1k
TP15
Q506
C532 0.022
R563 11k
TP11
R519 10k
R564 11k
C501
IC505
RV502 22k
R554
TP9 (TE)
RV502 (tracking gain)
RV501 (focus gain)

- **Semiconductor Lead Layouts**

LA2010
LA3161
TA7343AP

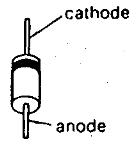

cut
or
dot
1 2
n

HA12047
TC9310N-049
LA1260S
LA4126T

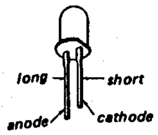

line
or
slit
or
dot
n+1
1 2
n

(Top view)

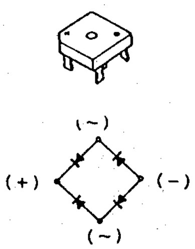
1S2687S-1
1SS133
SD113
1SS119
1SS106
RD5.1EB1
RD8.2EB2
HZ2ALL
RD12EB2T
HZ3.0EB1T2


cathode
anode

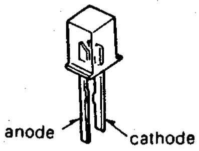
SLP135B
SLP235B
SLP435B


long
short
anode
cathode

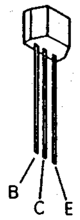
S2VB60Z



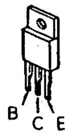
SLP153B-40
SLP253B-40


anode
cathode

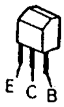
2SC2724-C
2SC2839-E
2SC2840-DL
2SC2603-F
2SC2458L-BL
2SB808-G1
2SA1048-GR



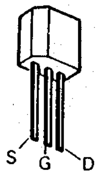
2SD880-GR



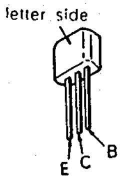
2SD773-4



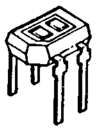
2SK184-BL



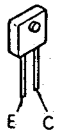
2SC2785-E


letter side
E
C
B

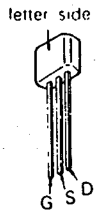
GP-2S04-B



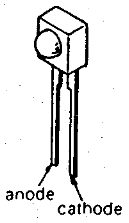
PH103-L



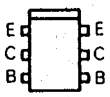
2SK193-E


letter side
G
S
D

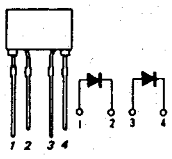
TLR213


anode
cathode

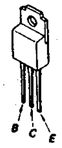
2SC3064-F



LT-9200N



2SD1273-P



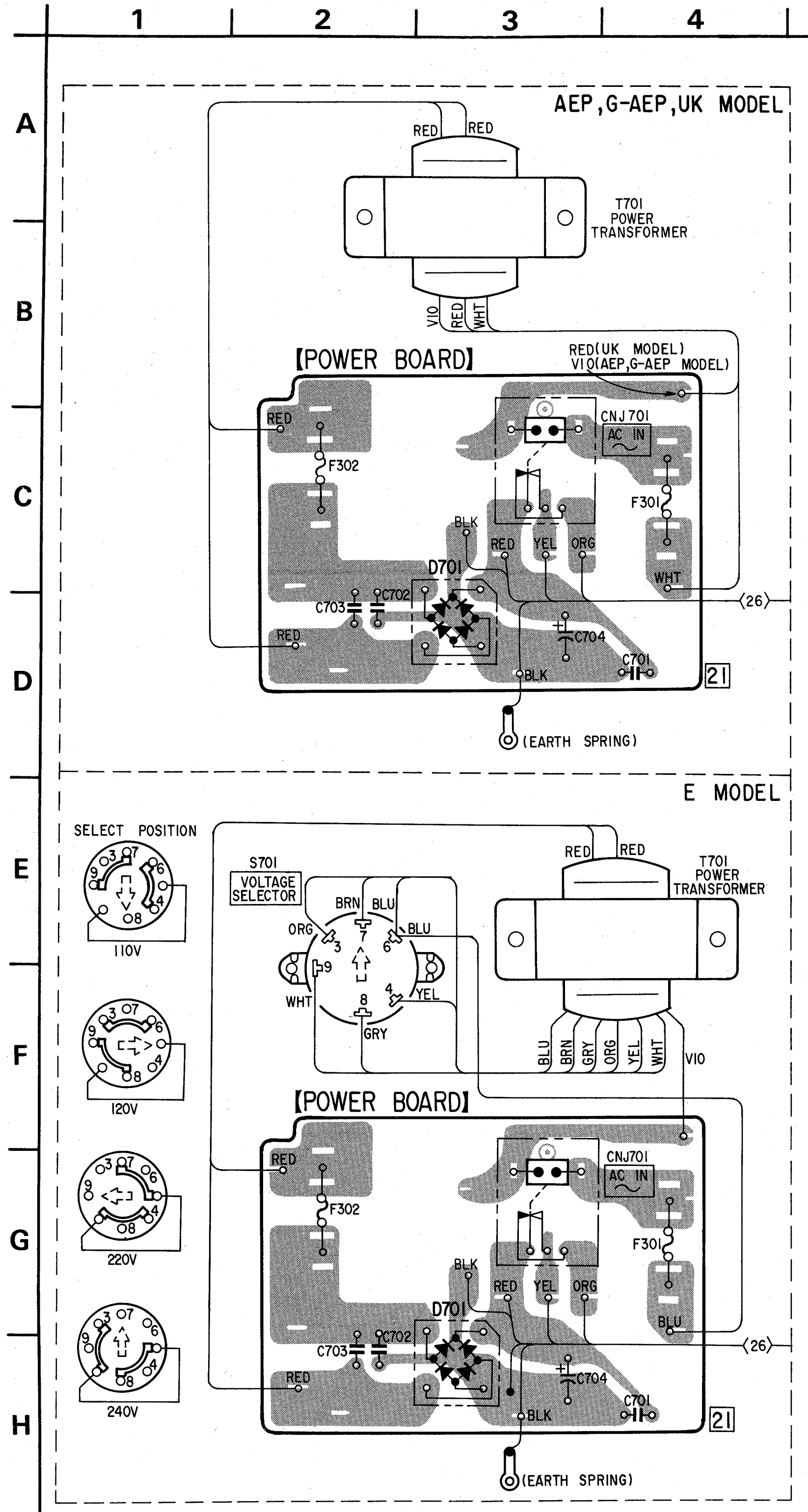
SECTION 4
DIAGRAMS

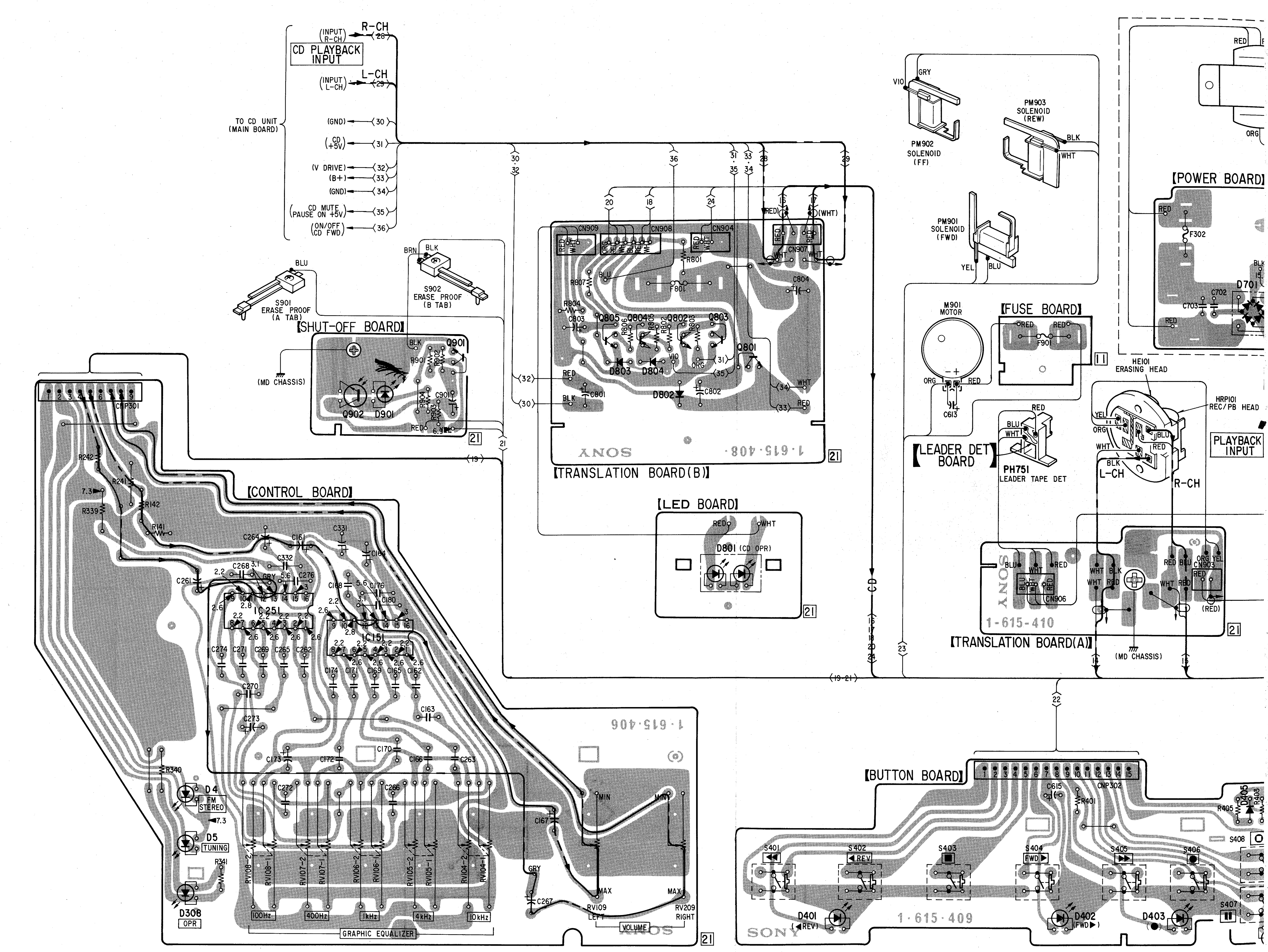
4-1. MOUNTING DIAGRAM (1) — Radio and Cassette-Recorder Section —

— Conductor Side —

- See page 62 for Semiconductor Lead Layouts.

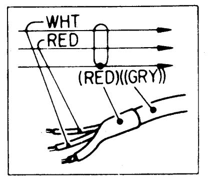
	6	7	8	9	10	11	12	13	14	15	16	
Q			902	901		805 804 802	803 801			PH751		
IC		IC251	IC151									
D		4 5 308	901			803 804	802 801	401		402	403	701 405


1
2
3
4
A
B
C
D
E
F
G
H
AEP,G-AEP,UK MODEL
RED
T701 POWER TRANSFORMER
VIO
WHT
【POWER BOARD】
RED(UK MODEL) VIO(AEP,G-AEP MODEL)
CNJ701 AC IN
F302
F301
BLK
D701
YEL
ORG
C703
C702
C704
C701
(26)
21
(EARTH SPRING)
E MODEL
SELECT POSITION
110V
120V
220V
240V
S701 VOLTAGE SELECTOR
BRN
BLU
GRY

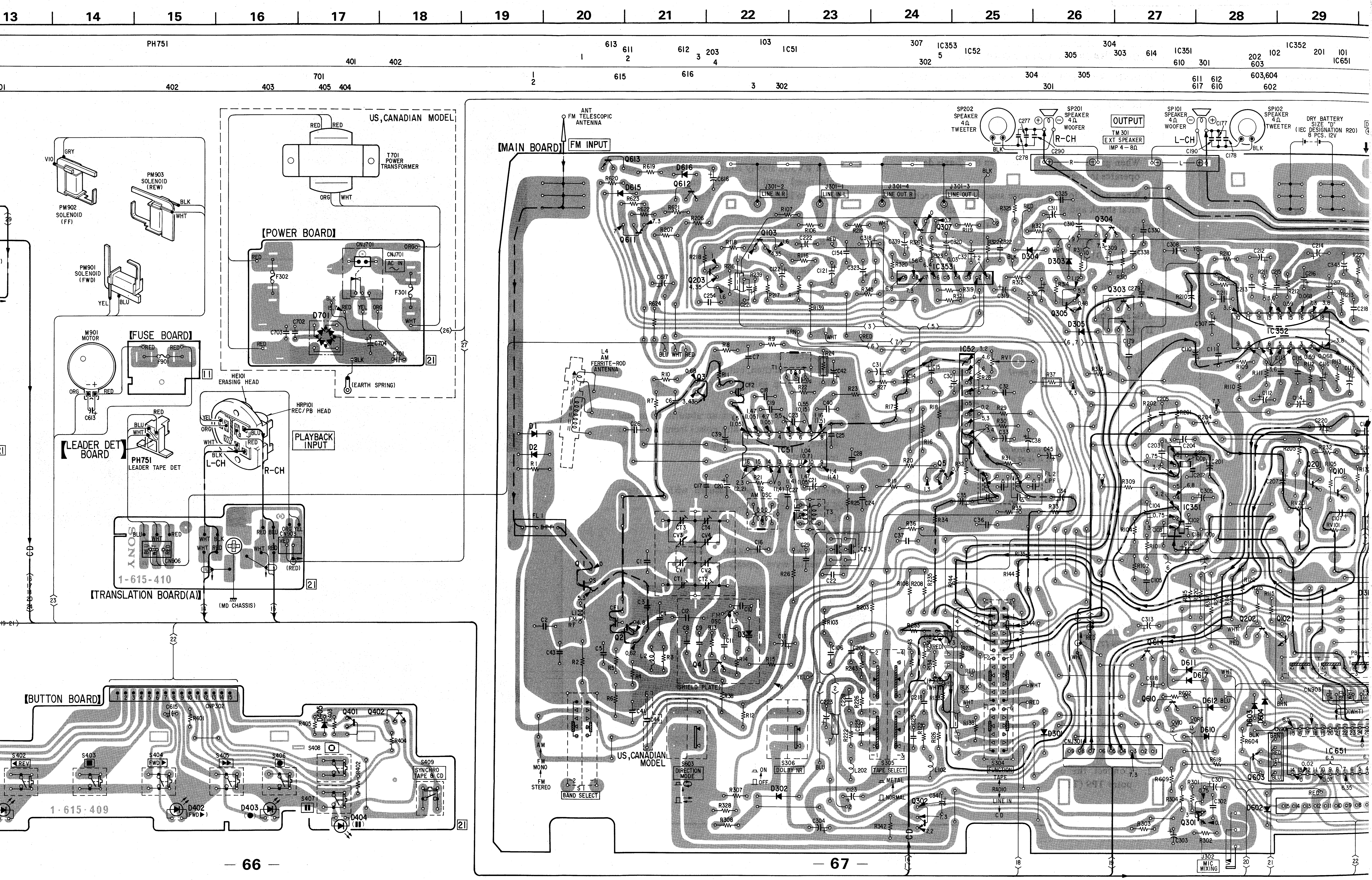

5
6
7
8
9
10
11
12
13
14
15
16
CD PLAYBACK INPUT
(INPUT R-CH) R-CH (28)
(INPUT L-CH) L-CH (29)
TO CD UNIT (MAIN BOARD)
(GND) (30)
(CD +5V) (31)
(V DRIVE) (32)
(B+) (33)
(GND) (34)
(CD MUTE PAUSE ON +5V) (35)
(ON/OFF CD FWD) (36)
S901 ERASE PROOF (A TAB)
S902 ERASE PROOF (B TAB)
【SHUT-OFF BOARD】
(MD CHASSIS)
Q901
Q902
D901
C901
【TRANSLATION BOARD(B)】
CN909
CN908
CN904
CN907
R801
F801
C804
C801
C802
C803
Q805
Q804
Q802
Q803
Q801
D803
D804
D802
1·615·408
SONY
【LED BOARD】
D801 (CD OPR)
【CONTROL BOARD】
CNP301
R242
R241
R142
R141
R339
IC251
IC151
1·615·406
D4 FM STEREO
D5 TUNING
D308 OPR
R340
R341
100Hz
400Hz
1kHz
4kHz
10kHz
GRAPHIC EQUALIZER
RV109 LEFT
RV209 RIGHT
VOLUME
MIN
MAX
CD
(19·21)
22
23
PM902 SOLENOID (FF)
PM903 SOLENOID (REW)
PM901 SOLENOID (FWD)
M901 MOTOR
【FUSE BOARD】
F901
C613
【LEADER DET BOARD】
PH751 LEADER TAPE DET
HE101 ERASING HEAD
HRP101 REC/PB HEAD
PLAYBACK INPUT
L-CH
R-CH
【TRANSLATION BOARD(A)】
1-615-410
CN906
CN903
【POWER BOARD】
【BUTTON BOARD】
CNP302
C615
R401
R405
S401
S402 ◀REV
S403 ■
S404 FWD▶
S405 ▶▶
S406 ●
S407 ❚❚
S408
D401 (◀REV)
D402 (FWD▶)
D403 (●)
1·615·409

Note:

- Color code of sleeving over the end of the jacket.


WHT
RED
(RED)(GRY)

- ○— : parts extracted from the component side.
- ●— : parts extracted from the conductor side.
- ■ : part mounted on the conductor side.
- ⬚ : indicates side identified with part number.
- ⟶ : signal path
- ⟶ : L-CH signal path
- ⟶ : R-CH signal path


13
14
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16
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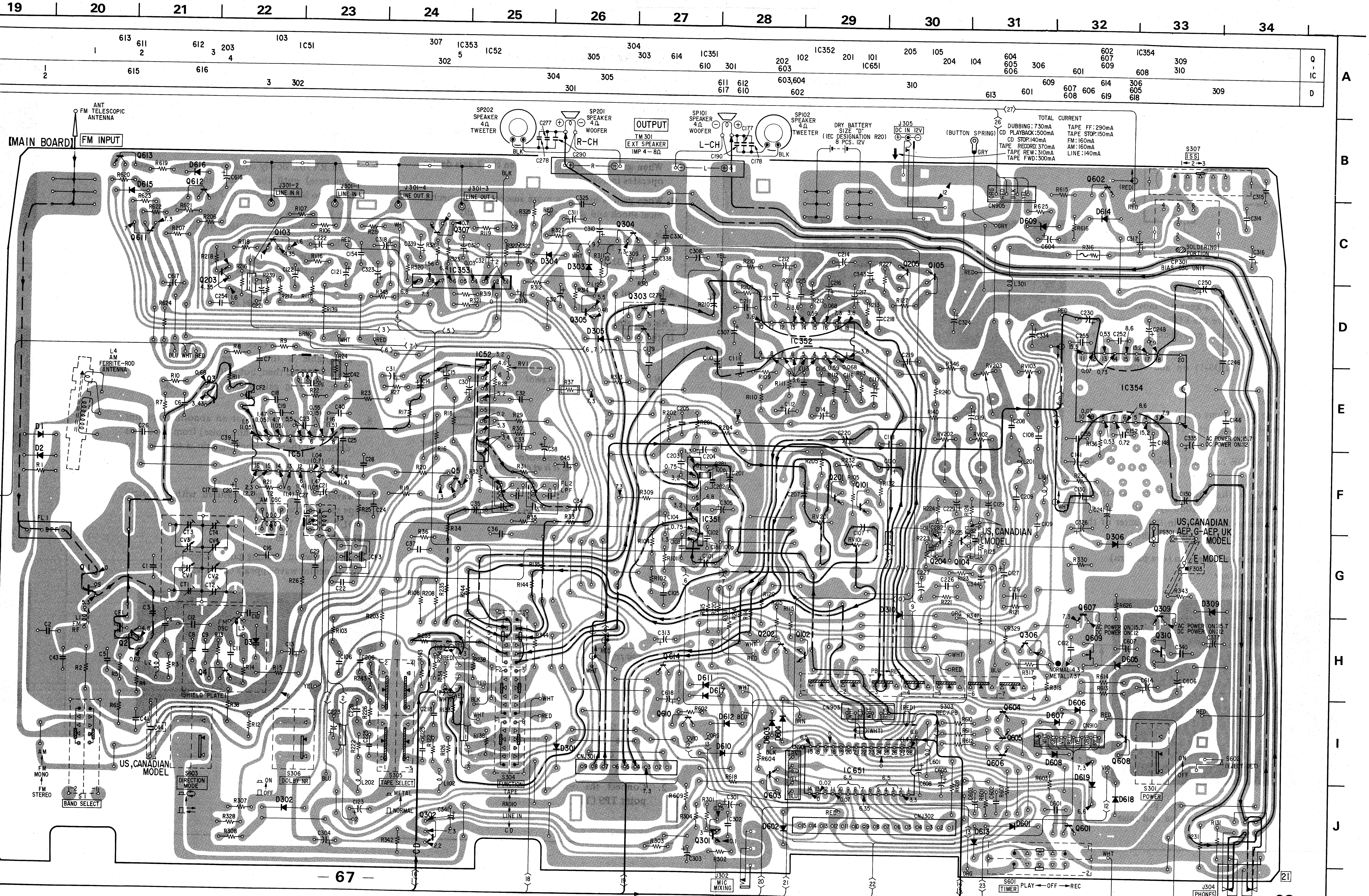
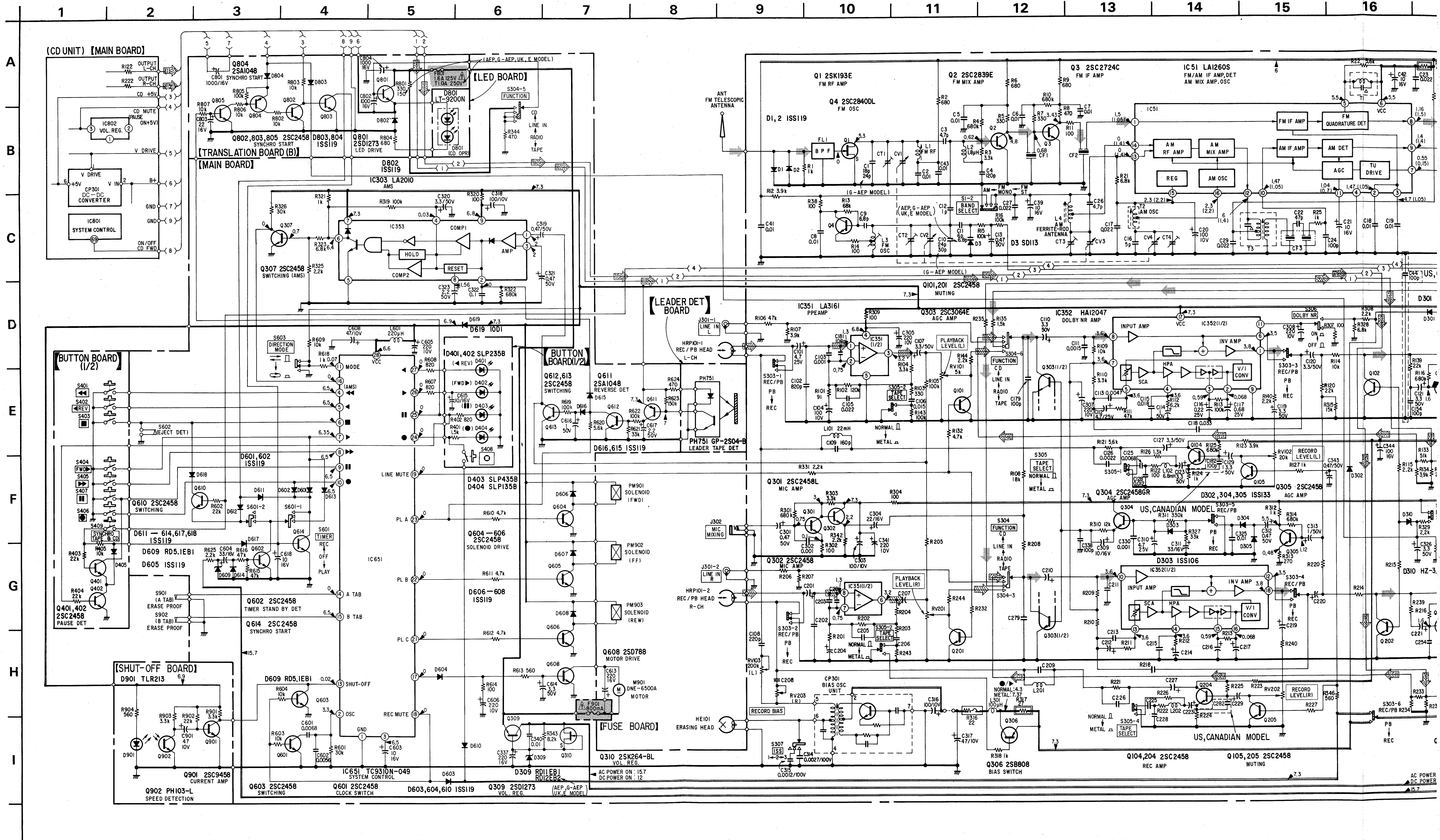
21
22
23
24
25
26
27
28
29
PH751
US, CANADIAN MODEL
T701 POWER TRANSFORMER
【POWER BOARD】
CNJ701
AC IN
F302
F301
D701
(EARTH SPRING)
PM902 SOLENOID (FF)
PM903 SOLENOID (REW)
PM901 SOLENOID (FWD)
M901 MOTOR
【FUSE BOARD】
F901
【LEADER DET BOARD】
PH751 LEADER TAPE DET
HE101 ERASING HEAD
HRP101 REC/PB HEAD
PLAYBACK INPUT
L-CH
R-CH
SONY
1-615-410
【TRANSLATION BOARD(A)】
(MD CHASSIS)
【BUTTON BOARD】
CNP302
S402 REV
S403
S404 FWD
S405
S406
S407
S408
S409 SYNCHRO TAPE & CD
D402 (FWD)
D403
D404
1·615·409
ANT FM TELESCOPIC ANTENNA
【MAIN BOARD】
FM INPUT
L4 AM FERRITE-ROD ANTENNA
J301-2 LINE IN R
J301-1 LINE IN L
J301-4 LINE OUT R
J301-3 LINE OUT L
IC51
IC52
IC351
IC352
IC353
IC651
AM OSC
FM OSC
(SHIELD PLATE)
US, CANADIAN MODEL
AM
FM MONO
FM STEREO
S1 BAND SELECT
S603 DIRECTION MODE
S306 DOLBY NR
ON
OFF
S305 TAPE SELECT
METAL
NORMAL
S304 FUNCTION
TAPE
RADIO
LINE IN
CD
CNJ301
CN901
CN903
SP202 SPEAKER 4Ω TWEETER
SP201 SPEAKER 4Ω WOOFER
SP101 SPEAKER 4Ω WOOFER
SP102 SPEAKER 4Ω TWEETER
OUTPUT
TM301 EXT SPEAKER IMP 4-8Ω
DRY BATTERY SIZE "D" (IEC DESIGNATION R20) 8 PCS. 12V
J302 MIC MIXING
FL1 BPF
FL2 LPF
RV1
RV101
RV201


MAIN BOARD
FM INPUT
ANT FM TELESCOPIC ANTENNA
L4 AM FERRITE-ROD ANTENNA
SP202 SPEAKER 4Ω TWEETER
SP201 SPEAKER 4Ω WOOFER
R-CH
OUTPUT
TM301 EXT SPEAKER IMP 4－8Ω
L-CH
SP101 SPEAKER 4Ω WOOFER
SP102 SPEAKER 4Ω TWEETER
DRY BATTERY SIZE "D" (IEC DESIGNATION R20) 8 PCS. 12V
J305 DC IN 12V
(BUTTON SPRING)
TOTAL CURRENT
DUBBING: 730mA
CD PLAYBACK: 500mA
CD STOP: 140mA
TAPE RECORD: 370mA
TAPE REW: 310mA
TAPE FWD: 300mA
TAPE FF: 290mA
TAPE STOP: 150mA
FM: 160mA
AM: 160mA
LINE: 140mA
S307 ISS
J301-2 LINE IN R
J301-1 LINE IN L
J301-4 LINE OUT R
J301-3 LINE OUT L
IC51
IC52
IC351
IC352
IC353
IC354
IC651
SOLDERING PORTION
CP301 BIAS OSC UNIT
US, CANADIAN MODEL
US, CANADIAN, AEP, G-AEP, UK MODEL
E MODEL
AC POWER ON: 15.7
DC POWER ON: 12
NORMAL: 4.3
METAL: 7.37
(SHIELD PLATE)
S1 BAND SELECT
AM
FM MONO
FM STEREO
S603 DIRECTION MODE
S306 DOLBY NR
S305 TAPE SELECT
METAL
NORMAL
S304 FUNCTION
TAPE
RADIO
LINE IN
CD
J302 MIC MIXING
S303 REC/PB
S601 TIMER PLAY－OFF－REC
S301 POWER
S602 (EJECT DET)
J304 PHONES
CN301
CN302
CN903
CN905
CN910
A
B
C
D
E
F
G
H
I
J
K
Q
IC
D

4-2. SCHEMATIC DIAGRAM (1) — Radio and Cassette-Recorder Section —


1
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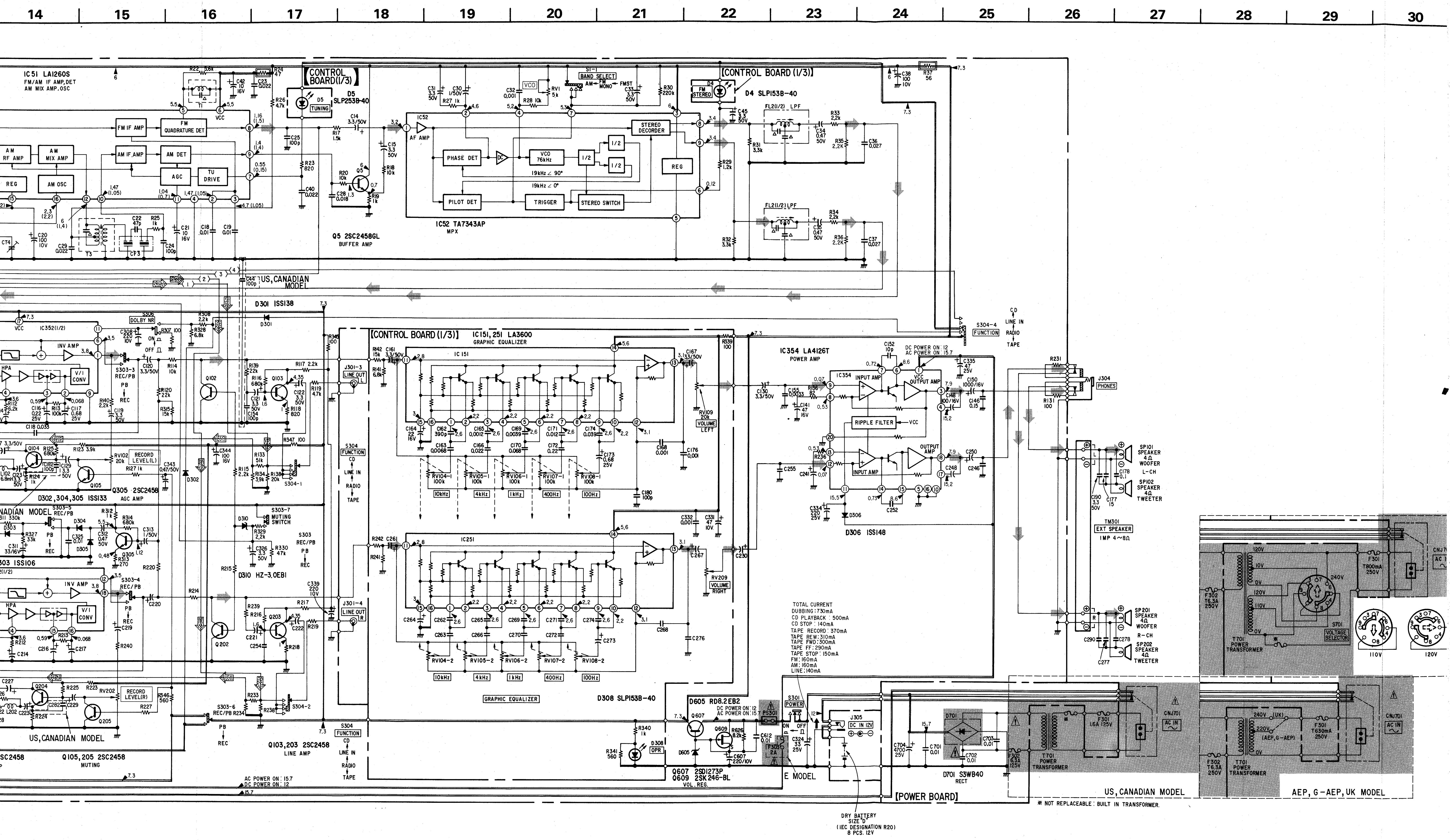
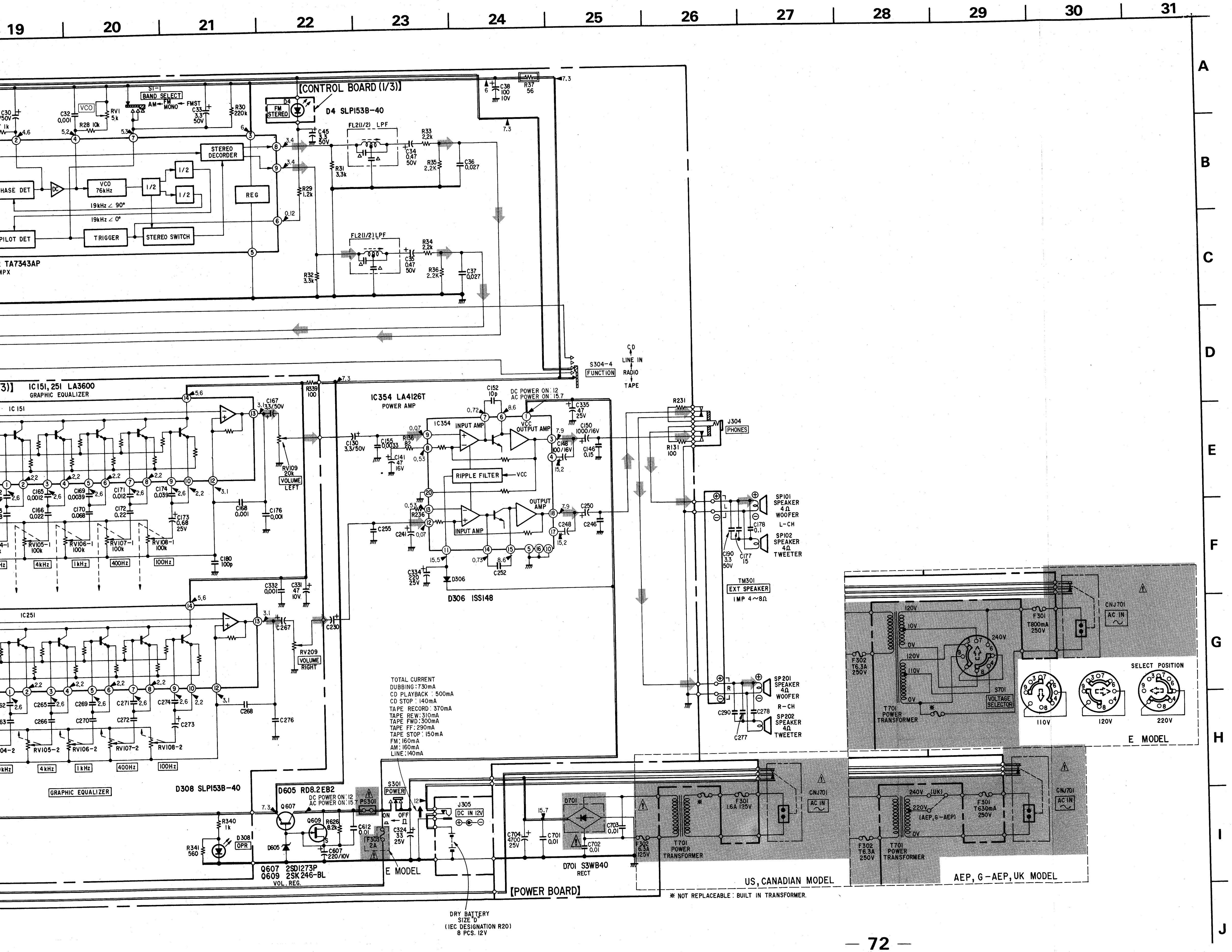
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
(CD UNIT) 【MAIN BOARD】
IC802 VOL. REG.
CP301 DC-DC CONVERTER
IC801 SYSTEM CONTROL
【TRANSLATION BOARD (B)】
【MAIN BOARD】
【LED BOARD】
Q804 2SA1048
Q802,803,805 2SC2458 SYNCHRO START
D803,804 1SS119
Q801 2SD1273 LED DRIVE
D802 1SS119
D801 LT-9200N
F801 1.6A 125V T1.0A 250V
IC303 LA2010 AMS
Q307 2SC2458 SWITCHING (AMS)
【LEADER DET BOARD】
【BUTTON BOARD(1/2)】
D401,402 SLP235B
D403 SLP435B
D404 SLP135B
Q612,613 2SC2458 SWITCHING
Q611 2SA1048 REVERSE DET
D616,615 1SS119
PH751 GP-2S04-B LEADER TAPE DET
Q610 2SC2458 SWITCHING
D611 — 614,617,618 1SS119
D609 RD5.1EB1
D605 1SS119
D601,602 1SS119
Q401,402 2SC2458 PAUSE DET
Q602 2SC2458 TIMER STAND BY DET
Q614 2SC2458 SYNCHRO START
IC651
Q604 — 606 2SC2458 SOLENOID DRIVE
D606 — 608 1SS119
PM901 SOLENOID (FWD)
PM902 SOLENOID (FF)
PM903 SOLENOID (REW)
Q608 2SD788 MOTOR DRIVE
M901 DNE-6500A MOTOR
F901 800mA
【FUSE BOARD】
【SHUT-OFF BOARD】
D901 TLR213
Q901 2SC9458 CURRENT AMP
Q902 PH103-L SPEED DETECTION
Q603 2SC2458 SWITCHING
Q601 2SC2458 CLOCK SWITCH
IC651 TC9310N-049 SYSTEM CONTROL
D603,604,610 1SS119
Q309 2SD1273 VOL. REG.
D309 RD11EB1 RD12EB2
Q310 2SK264-BL VOL. REG.
(AEP,G-AEP UK,E MODEL)
AC POWER ON : 15.7
DC POWER ON : 12
ANT FM TELESCOPIC ANTENNA
Q1 2SK193E FM RF AMP
Q2 2SC2839E FM MIX AMP
Q3 2SC2724C FM IF AMP
Q4 2SC2840DL FM OSC
IC51 LA1260S FM/AM IF AMP,DET AM MIX AMP,OSC
D1,2 1SS119
D3 SD113
AM FERRITE-ROD ANTENNA
S1-2 BAND SELECT
FM IF AMP
FM QUADRATURE DET
AM IF AMP
AM DET
AGC
TU DRIVE
AM RF AMP
AM MIX AMP
REG
AM OSC
IC351 LA3161 PPEAMP
Q303 2SC3064E AGC AMP
Q101,201 2SC2458 MUTING
IC352 HA12047 DOLBY NR AMP
HRP101-1 REC/PB HEAD L-CH
HRP101-2 REC/PB HEAD R-CH
HE101 ERASING HEAD
J301-1 LINE IN L
J301-2 LINE IN R
J302 MIC MIXING
Q301 2SC2458L MIC AMP
Q302 2SC2458 MIC AMP
PLAYBACK LEVEL(L)
PLAYBACK LEVEL(R)
S304 FUNCTION CD LINE IN RADIO TAPE
S305 TAPE SELECT NORMAL METAL
S306 DOLBY NR
RECORD LEVEL(L)
RECORD LEVEL(R)
Q304 2SC2458GR AGC AMP
US,CANADIAN MODEL
D302,304,305 1SS133
D303 1SS106
Q305 2SC2458 AGC AMP
CP301 BIAS OSC UNIT
RECORD BIAS
Q306 2SB808 BIAS SWITCH
Q104,204 2SC2458 REC AMP
Q105,205 2SC2458 MUTING
INPUT AMP
INV AMP
HPA
SCA
V/I CONV
D310 HZ-3


14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
IC51 LA1260S
FM/AM IF AMP,DET
AM MIX AMP,OSC
FM IF AMP
FM QUADRATURE DET
AM RF AMP
AM MIX AMP
AM IF AMP
AM DET
AGC
TU DRIVE
REG
AM OSC
CONTROL BOARD (1/3)
D5 SLP253B-40
TUNING
Q5 2SC2458GL
BUFFER AMP
IC52
AF AMP
PHASE DET
VCO 76kHz
19kHz ∠ 90°
19kHz ∠ 0°
PILOT DET
TRIGGER
STEREO SWITCH
STEREO DECORDER
REG
IC52 TA7343AP
MPX
S1-1
BAND SELECT
AM ← FM MONO → FMST
FM STEREO
D4 SLP153B-40
FL2(1/2) LPF
FL2(1/2) LPF
US, CANADIAN MODEL
D301 ISS138
IC352(1/2)
S306 DOLBY NR
INV AMP
HPA
V/I CONV
S303-3 REC/PB
PB
REC
RECORD LEVEL(L)
RV102
Q305 2SC2458
AGC AMP
D302,304,305 ISS133
CANADIAN MODEL
S303-7 MUTING SWITCH
D310 HZ-3.0EB1
S303-5 REC/PB
S303-4 REC/PB
S303 ISS106
RECORD LEVEL(R)
RV202
S303-6 REC/PB
S304-1
S304-2
US, CANADIAN MODEL
Q105,205 2SC2458
MUTING
Q103,203 2SC2458
LINE AMP
J301-3 LINE OUT
J301-4 LINE OUT
S304 FUNCTION
CD
LINE IN
RADIO
TAPE
AC POWER ON: 15.7
DC POWER ON: 12
CONTROL BOARD (1/3)
IC151, 251 LA3600
GRAPHIC EQUALIZER
IC151
IC251
10kHz
4kHz
1kHz
400Hz
100Hz
GRAPHIC EQUALIZER
RV109 VOLUME LEFT
RV209 VOLUME RIGHT
S304-4 FUNCTION
CD
LINE IN
RADIO
TAPE
IC354 LA4126T
POWER AMP
DC POWER ON: 12
AC POWER ON: 15.7
INPUT AMP
OUTPUT AMP
RIPPLE FILTER
D306 ISS148
D308 SLP153B-40
D605 RD8.2EB2
Q607 2SD1273P
Q609 2SK246-BL
VOL.REG.
OPR
S301 POWER
PS301
J305 DC IN 12V
ON OFF
E MODEL
D701 S3WB40
RECT
POWER BOARD
DRY BATTERY
SIZE "D"
(IEC DESIGNATION R20)
8 PCS. 12V
J304 PHONES
SP101 SPEAKER 4Ω WOOFER
L-CH
SP102 SPEAKER 4Ω TWEETER
TM301 EXT SPEAKER
IMP 4~8Ω
SP201 SPEAKER 4Ω WOOFER
R-CH
SP202 SPEAKER 4Ω TWEETER
T701 POWER TRANSFORMER
F301 1.6A 125V
F302 6.3A 125V
CN701 AC IN
US, CANADIAN MODEL
F301 T630mA 250V
F302 T6.3A 250V
240V (UK)
220V (AEP,G-AEP)
AEP, G-AEP, UK MODEL
F301 T800mA 250V
S701 VOLTAGE SELECTOR
120V
110V
240V
110V
120V
* NOT REPLACEABLE: BUILT IN TRANSFORMER.

TOTAL CURRENT
DUBBING: 730mA
CD PLAYBACK : 500mA
CD STOP : 140mA
TAPE RECORD : 370mA
TAPE REW: 310mA
TAPE FWD: 300mA
TAPE FF: 290mA
TAPE STOP : 150mA
FM: 160mA
AM: 160mA
LINE: 140mA


19
20
21
22
23
24
25
26
27
28
29
30
31
A
B
C
D
E
F
G
H
I
J
[CONTROL BOARD (1/3)]
S1-1 BAND SELECT
AM ← FM MONO → FMST
D4 SLP153B-40
FM STEREO
VCO
RV1 5k
STEREO DECORDER
REG
PHASE DET
VCO 76kHz
19kHz ∠ 90°
19kHz ∠ 0°
PILOT DET
TRIGGER
STEREO SWITCH
TA7343AP
MPX
FL2(1/2) LPF
C36 0.027
C37 0.027
S304-4 FUNCTION
CD
LINE IN
RADIO
TAPE
IC151, 251 LA3600
GRAPHIC EQUALIZER
IC151
IC251
RV109 20k VOLUME LEFT
RV209 VOLUME RIGHT
4kHz
1kHz
400Hz
100Hz
IC354 LA4126T
POWER AMP
DC POWER ON: 12
AC POWER ON: 15.7
INPUT AMP
VCC OUTPUT AMP
RIPPLE FILTER
OUTPUT AMP
D306 ISS148
J304 PHONES
SP101 SPEAKER 4Ω WOOFER
L-CH
SP102 SPEAKER 4Ω TWEETER
TM301 EXT SPEAKER IMP 4~8Ω
SP201 SPEAKER 4Ω WOOFER
R-CH
SP202 SPEAKER 4Ω TWEETER
GRAPHIC EQUALIZER
D308 SLP153B-40
D605 RD8.2EB2
DC POWER ON: 12
AC POWER ON: 15.7
Q607 2SD1273P
Q609 2SK246-BL
VOL. REG.
S301 POWER
ON OFF
J305 DC IN 12V
E MODEL
TOTAL CURRENT
DUBBING: 730mA
CD PLAYBACK: 500mA
CD STOP: 140mA
TAPE RECORD: 370mA
TAPE REW: 310mA
TAPE FWD: 300mA
TAPE FF: 290mA
TAPE STOP: 150mA
FM: 160mA
AM: 160mA
LINE: 140mA
D701 S3WB40
RECT
[POWER BOARD]
DRY BATTERY SIZE "D" (IEC DESIGNATION R20) 8 PCS. 12V
T701 POWER TRANSFORMER
CNJ701 AC IN
F301 1.6A 125V
F302 6.3A 125V
US, CANADIAN MODEL
F301 T630mA 250V
F302 T6.3A 250V
AEP, G-AEP, UK MODEL
240V (UK)
220V (AEP, G-AEP)
F301 T800mA 250V
S701 VOLTAGE SELECTOR
SELECT POSITION
110V
120V
220V
240V
E MODEL
✱ NOT REPLACEABLE: BUILT IN TRANSFORMER.

Note:

- All capacitors are in μF unless otherwise noted. pF: $\mu\mu$F 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $^1/_4$W or less unless otherwise specified.
- ⇨ : FM signal path
- ⇨ : CD signal path
- ⇨ : Deck signal path

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- Components for right channel have same values as for left channel. Reference numbers are coded from 200.
- △ : internal component.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- Switch with sliding contact indicated by hatched lines shows shorting type.
- Switch

Ref. No.	Switch	Position
S1	BAND SELECT	FM ST
S301	POWER	OFF
S303	REC/PB	PB
S304	FUNCTION	RADIO
S305	TAPE SELECT	NORMAL
S306	DOLBY NR	OFF
S307	ISS	2
S401	◀◀	OFF
S402	◀REV	OFF
S403	■	OFF
S404	FWD▶	OFF
S405	▶▶	OFF
S406	●	OFF
S407	❚❚	OFF
S408	O	OFF
S409	SYNCHRO TAPE & DC	OFF
S601	TIMER	OFF
S602	EJECT DET	OFF
S603	DIRECTION MODE	OFF
S901	ACCIDENTAL ERASURE (A)	OFF
S902	ACCIDENTAL ERASURE (B)	OFF

- ▬ : B+ bus.
- ▭ : adjustment for repair.
- Readings are taken under no-signal (detuned) conditions with a VOM (50 kΩ/V).
- ●/▶ : record mode

Note for schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics
- All resistors are in ohms, ¼W or less unless otherwise specified.
- ⇨ : signal path.
- Components for right channel have same values as for left channel. Reference numbers are coded from 200.
- △ : internal component.
- 1% shows tolerance.
- ▬▬ : B+ bus.
- ▬ ▬ ▬ : B– bus.
- ▭ : adjustment for repair.
- Voltages, waveform and total current are measured with top panel closed.
- Power voltage is DC 9 V and fed with regulated dc power supply from main board of radio/cassette recorder.
  Voltages are DC with respect to ground in service mode.
  Voltage variations may be noted due to normal production tolerances.
  no mark: stop mode
  ( ) : play mode
- Waveforms are taken to ground in service mode by using oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Total current is measured in service mode.
- **Switch**

Ref. No.	Switch	Position
S901	LASER ON	ON
S902	OPEN/CLOSE	ON
S903	LIMIT	OFF
S904	REMAIN	OFF
S905	MODE	OFF
S906	▶❚❚(PLAY/PAUSE)	OFF
S907	▶▶❘ (FF)	OFF
S908	❘◀◀ (FR)	OFF
S909	■ (STOP)	OFF

See page 10 – 14 for setup of service mode.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

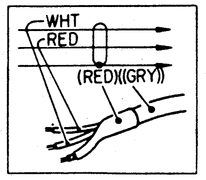
Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

4-3. MOUNTING DIAGRAM (2) – CD Player Section – • See page 84 for Semiconductor Lead Layouts.

– Conductor Side –

Note:

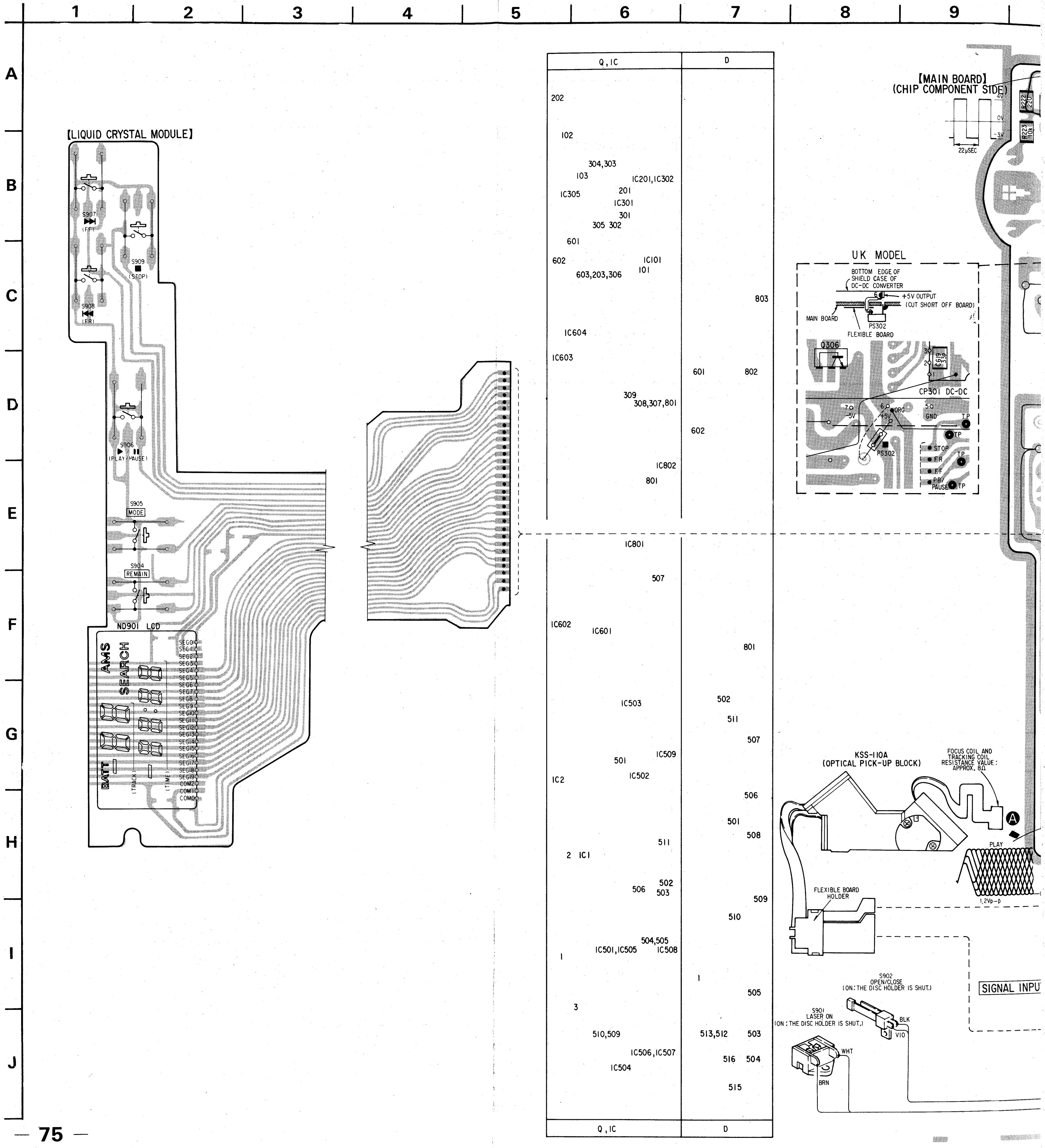
- Color code of sleeving over the end of the jacket.


WHT
RED
(RED)((GRY))

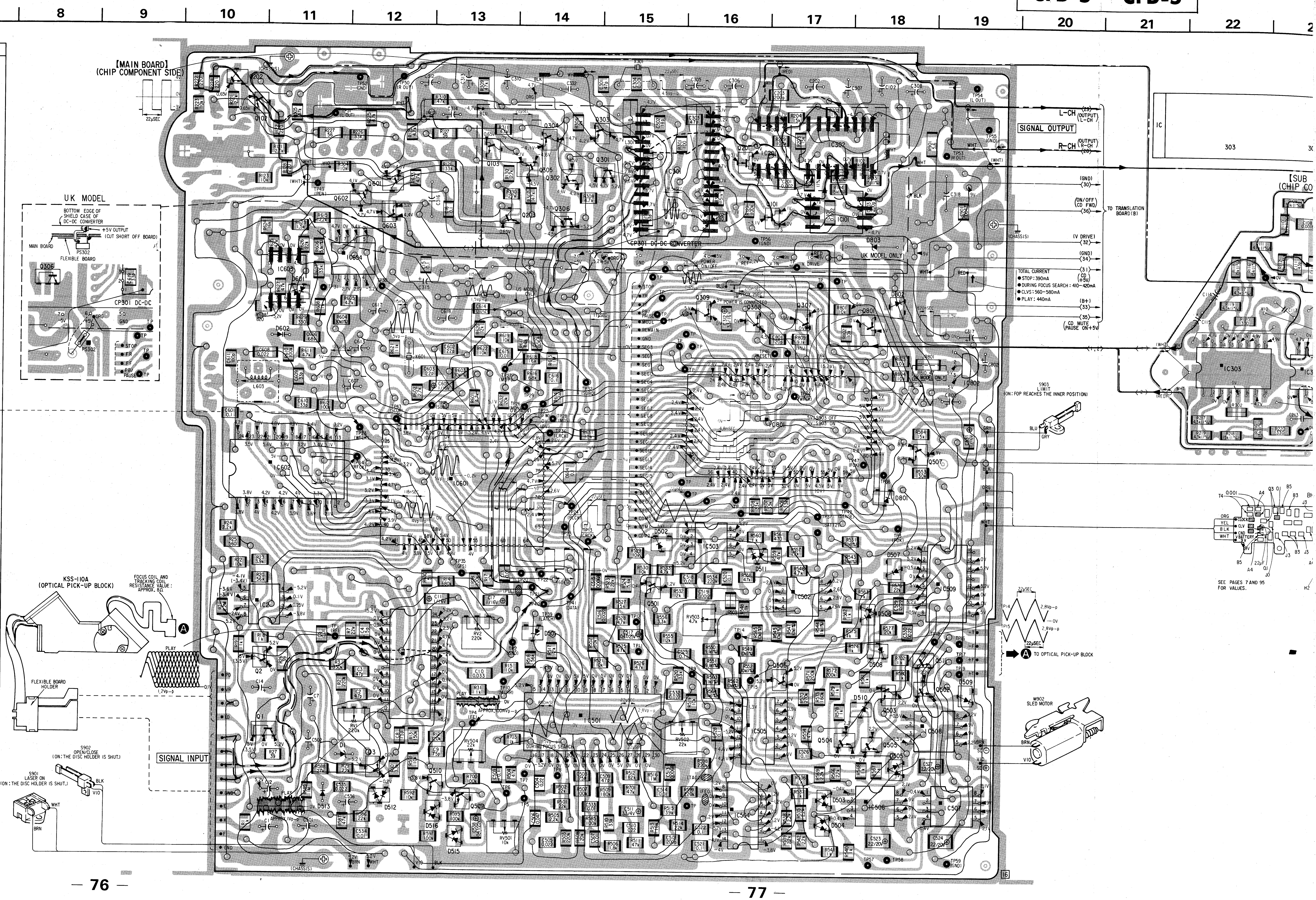
- ○—— : parts extracted from the side where DC-DC converter unit is mounted.
- ●—— : parts extracted from chip component side.

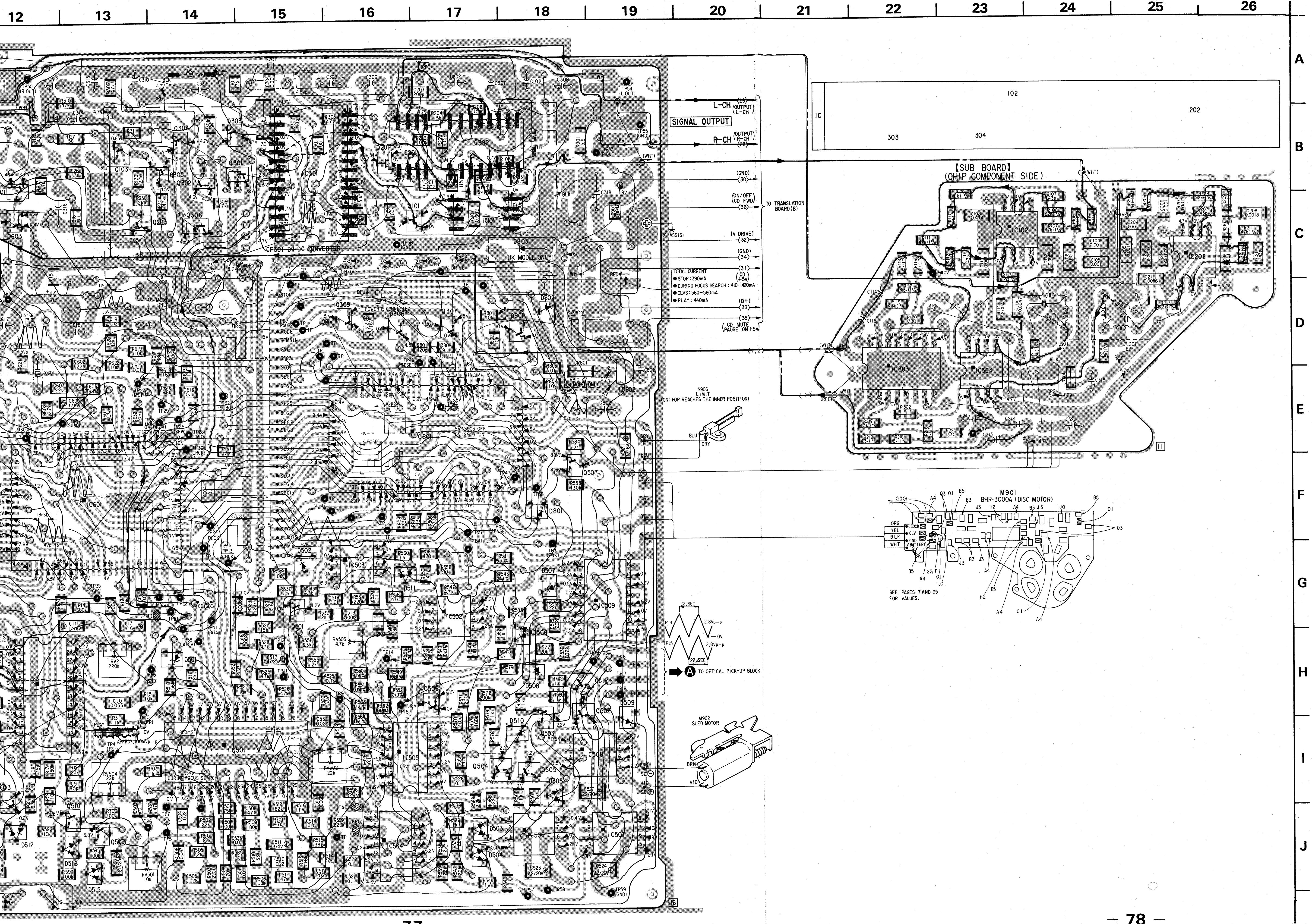
Through hole

- ○⌒○ conductor pattern where DC DC converter unit is mounted.
- ▬➔▬ : signal path
- ▬▬▬➔ : L-CH signal path
- ▬·▬➔ : R-CH signal path


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
[LIQUID CRYSTAL MODULE]
S907 ▶▶❘ (FF)
S909 ■ (STOP)
S908 ❘◀◀ (FR)
S906 ▶ ❚❚ (PLAY/PAUSE)
S905 MODE
S904 REMAIN
ND901 LCD
AMS
SEARCH
BATT
(TRACK)
(TIME)
SEG0
SEG1
SEG2
SEG3
SEG4
SEG5
SEG6
SEG7
SEG8
SEG9
SEG10
SEG11
SEG12
SEG13
SEG14
SEG15
SEG16
SEG17
SEG18
SEG19
COM2
COM1
COM0
Q, IC
D
202
102
304,303
103
IC201,IC302
201
IC305
IC301
301
305 302
601
602
IC101
101
603,203,306
803
IC604
IC603
601
802
309
308,307,801
602
IC802
801
IC801
507
IC602
IC601
801
IC503
502
511
507
501
IC509
IC502
IC2
506
501
508
511
2 IC1
502
503
506
509
510
504,505
IC501,IC505
IC508
1
1
505
3
510,509
513,512
503
IC506,IC507
516
504
IC504
515
Q, IC
D
[MAIN BOARD]
(CHIP COMPONENT SIDE)
0V
–3V
22μSEC
UK MODEL
BOTTOM EDGE OF SHIELD CASE OF DC-DC CONVERTER
+5V OUTPUT
(CUT SHORT OFF BOARD)
MAIN BOARD
PS302
FLEXIBLE BOARD
Q306
C619 33p
CP301 DC-DC
7 –5V
6 +5V
ORG
5 GND
TP
PS302
STOP
FR
FF
PB/PAUSE
KSS-110A
(OPTICAL PICK-UP BLOCK)
FOCUS COIL AND TRACKING COIL RESISTANCE VALUE: APPROX. 8Ω
A
PLAY
1.2Vp-p
FLEXIBLE BOARD HOLDER
S902 OPEN/CLOSE (ON: THE DISC HOLDER IS SHUT.)
S901 LASER ON (ON: THE DISC HOLDER IS SHUT.)
BLK
VIO
WHT
BRN
SIGNAL INPU

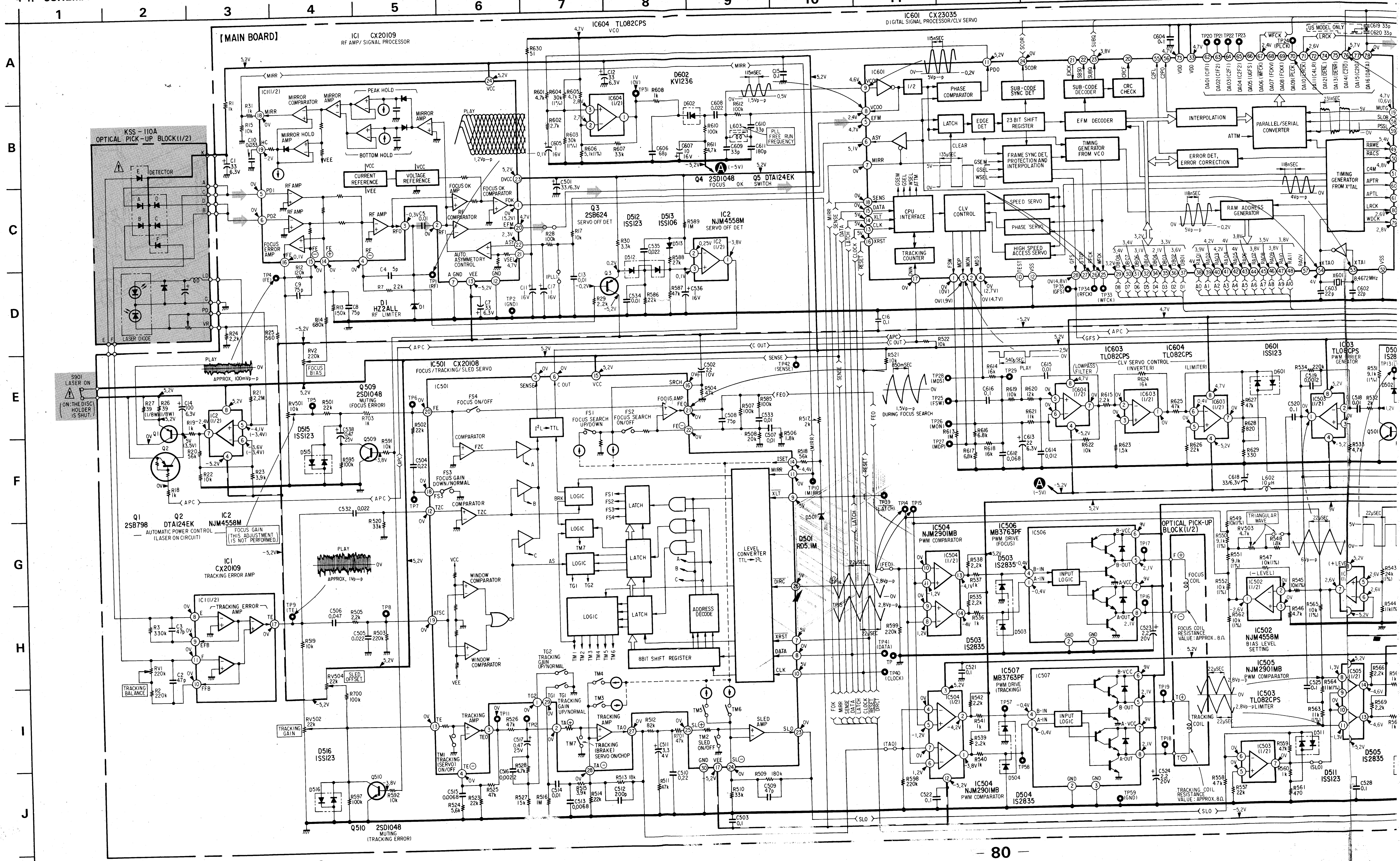
D
,IC302
101
803
601 802
07,801
602
IC802
01
507
801
502
511
507
IC509
506
501 508
511
502 503
509
510
505 IC508
1
505
513,512 503
C507
516 504
515
D

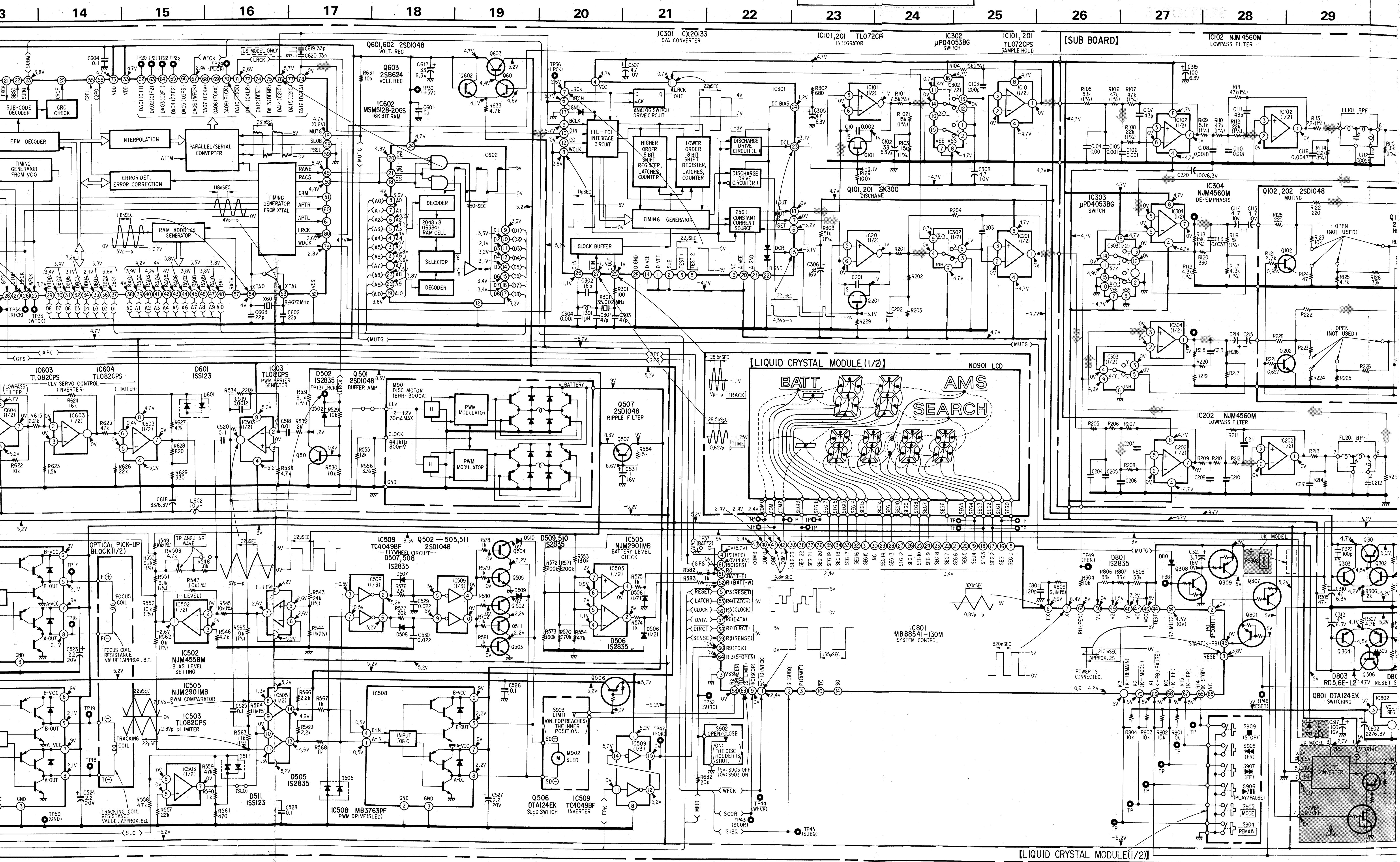

7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
[MAIN BOARD]
(CHIP COMPONENT SIDE)
22μSEC
UK MODEL
BOTTOM EDGE OF SHIELD CASE OF DC-DC CONVERTER
+5V OUTPUT (CUT SHORT OFF BOARD)
MAIN BOARD
PS302
FLEXIBLE BOARD
Q306
CP301 DC-DC
STOP
FR
FF
PB/PAUSE
CP301 DC-DC CONVERTER
L-CH (OUTPUT) L-CH (29)
SIGNAL OUTPUT
R-CH (OUTPUT) R-CH (28)
(GND) (30)
(ON/OFF) (CD FWD) (36)
TO TRANSLATION BOARD (B)
(V DRIVE) (32)
(GND) (34)
(31)
(CD) (+5V)
(33)
(35)
(CD MUTE) (PAUSE ON+5V)
TOTAL CURRENT
● STOP: 390mA
● DURING FOCUS SEARCH: 410–420mA
● CLVS: 560–580mA
● PLAY: 440mA
UK MODEL ONLY
US MODEL ONLY
POWER IS CONNECTED
IC303
[SUB (CHIP CO
S903 LIMIT (ON: FOP REACHES THE INNER POSITION)
SEE PAGES 7 AND 95 FOR VALUES.
KSS-110A (OPTICAL PICK-UP BLOCK)
FOCUS COIL AND TRACKING COIL RESISTANCE VALUE: APPROX. 8Ω
PLAY
FLEXIBLE BOARD HOLDER
S902 OPEN/CLOSE (ON: THE DISC HOLDER IS SHUT.)
S901 LASER ON (ON: THE DISC HOLDER IS SHUT.)
SIGNAL INPUT
TO OPTICAL PICK-UP BLOCK
M902 SLED MOTOR
DURING FOCUS SEARCH
IC501
IC502
IC503
IC504
IC505
IC506
IC507
IC508
IC509
IC601
IC602
IC603
IC604
IC801
IC802
IC101
IC201
IC301
IC302
(CHASSIS)
16

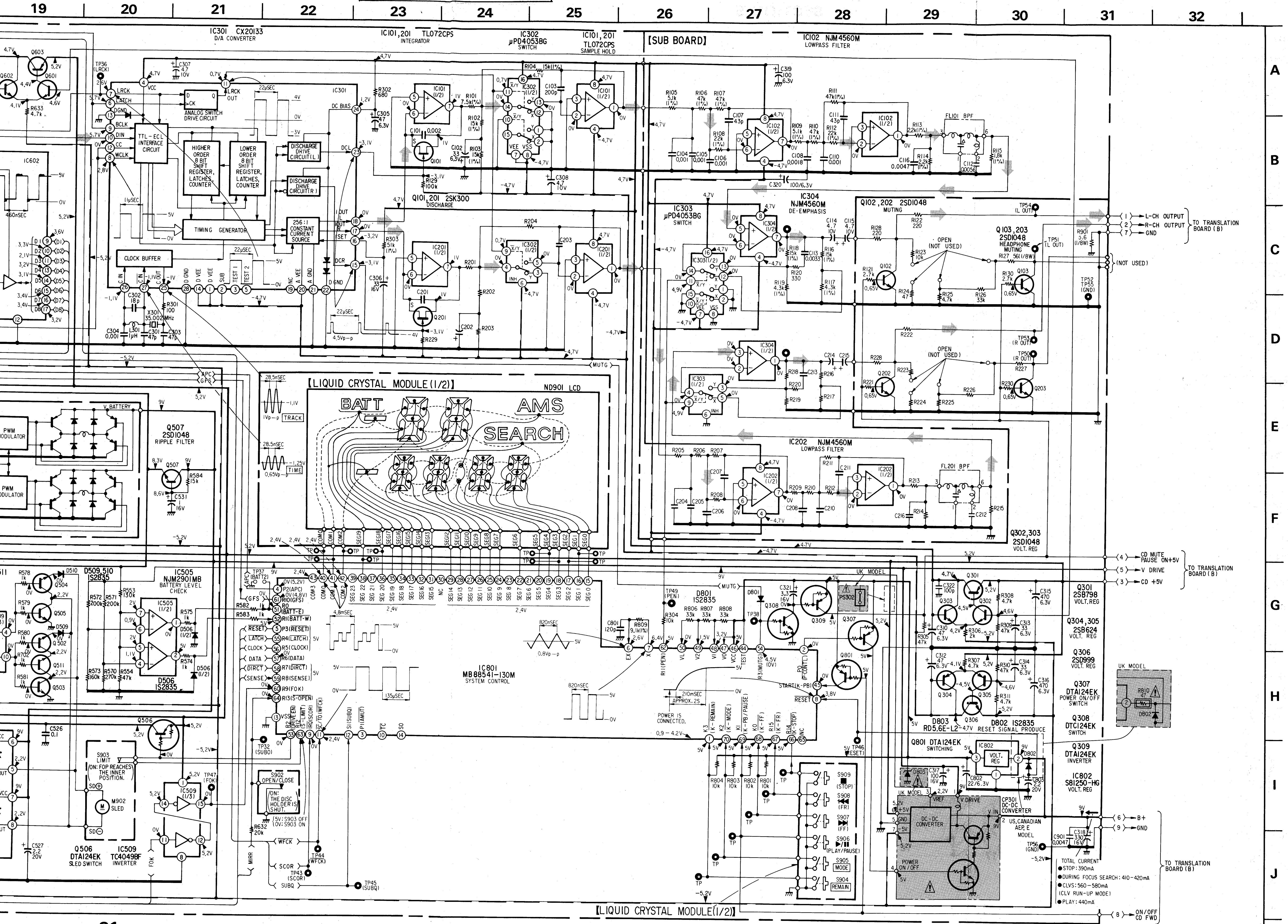

12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
A
B
C
D
E
F
G
H
I
J
SIGNAL OUTPUT
L-CH (OUTPUT) L-CH (25)
R-CH (OUTPUT) R-CH (26)
(GND) (30)
(ON/OFF) (CD FWD) (36)
TO TRANSLATION BOARD (B)
(CHASSIS)
(V DRIVE) (32)
(GND) (34)
(31)
(CD) (+5V)
(B+) (33)
(35)
(CD MUTE) (PAUSE ON+5V)
TOTAL CURRENT
● STOP: 390mA
● DURING FOCUS SEARCH: 410–420mA
● CLVS: 560–580mA
● PLAY: 440mA
CP301 DC-DC CONVERTER
UK MODEL ONLY
US MODEL ONLY
POWER IS CONNECTED
S903 LIMIT
(ON: FOP REACHES THE INNER POSITION)
TO OPTICAL PICK-UP BLOCK
22μSEC
2.8Vp-p
M902 SLED MOTOR
【SUB BOARD】
(CHIP COMPONENT SIDE)
IC102
IC202
IC303
IC304
M901
BHR-3000A (DISC MOTOR)
SEE PAGES 7 AND 95 FOR VALUES.
IC
102
202
303
304
DURING FOCUS SEARCH
APPROX. 100mVp-p
IC501
IC502
IC503
IC504
IC505
IC506
IC507
IC508
IC509
IC601

4-4. SCHEMATIC DIAGRAM (2) — CD Player Section —

• See page 74 for Note.


[MAIN BOARD]
IC1 CX20109 RF AMP/SIGNAL PROCESSOR
KSS-110A OPTICAL PICK-UP BLOCK (1/2)
DETECTOR
LASER DIODE
S901 LASER ON (ON: THE DISC HOLDER IS SHUT.)
MIRROR COMPARATOR
MIRROR AMP
PEAK HOLD
MIRROR HOLD AMP
BOTTOM HOLD
CURRENT REFERENCE
VOLTAGE REFERENCE
RF AMP
FOCUS ERROR AMP
FOCUS OK AMP
FOCUS OK COMPARATOR
RF COMPARATOR
AUTO ASYMMETRORY CONTROL
D1 HZ2ALL RF LIMITER
PLAY 1.2Vp-p
IC604 TL082CPS VCO
D602 KV1236
PLL FREE RUN FREQUENCY
Q4 2SD1048 FOCUS OK
Q5 DTA124EK SWITCH
Q3 2SB624 SERVO OFF DET
D512 1SS123
D513 1SS106
IC2 NJM4558M SERVO OFF DET
IC601 CX23035 DIGITAL SIGNAL PROCESSOR/CLV SERVO
PHASE COMPARATOR
SUB-CODE SYNC DET
SUB-CODE DECODER
CRC CHECK
LATCH
EDGE DET
23 BIT SHIFT REGISTER
EFM DECODER
INTERPOLATION
PARALLEL/SERIAL CONVERTER
FRAME SYNC DET, PROTECTION AND INTERPOLATION
TIMING GENERATOR FROM VCO
ERROR DET, ERROR CORRECTION
TIMING GENERATOR FROM X'TAL
CPU INTERFACE
CLV CONTROL
SPEED SERVO
PHASE SERVO
HIGH SPEED ACCESS SERVO
RAM ADDRESS GENERATOR
TRACKING COUNTER
X601 8.4672MHz
US MODEL ONLY
Q1 2SB798
Q2 DTA124EK
IC2 NJM4558M
AUTOMATIC POWER CONTROL (LASER ON CIRCUIT)
FOCUS GAIN (THIS ADJUSTMENT IS NOT PERFORMED.)
PLAY APPROX. 100mVp-p
FOCUS BIAS
IC501 CX20108 FOCUS/TRACKING/SLED SERVO
Q509 2SD1048 MUTING (FOCUS ERROR)
D515 1SS123
FS4 FOCUS ON/OFF
COMPARATOR
FS3 FOCUS GAIN DOWN/NORMAL
FS1 FOCUS SEARCH UP/DOWN
FS2 FOCUS SEARCH ON/OFF
FOCUS AMP
LEVEL CONVERTER TTL→I²L
LOGIC
LATCH
ADDRESS DECODE
8BIT SHIFT REGISTER
D501 RD5.1M
WINDOW COMPARATOR
IC1 CX20109 TRACKING ERROR AMP
IC1(1/2) TRACKING ERROR AMP
PLAY APPROX. 1Vp-p
TRACKING BALANCE
SLED OFFSET
TRACKING GAIN
D516 1SS123
Q510 2SD1048 MUTING (TRACKING ERROR)
TRACKING AMP
TM1 TRACKING (SERVO) ON/OFF
TG1 TG2 TRACKING GAIN UP/NORMAL
TM7 TRACKING (BRAKE) SERVO ON/CHOP
TM2 SLED ON/OFF
SLED AMP
IC603 TL082CPS CLV SERVO CONTROL
IC604 TL082CPS
(LOWPASS) FILTER
(INVERTER)
(LIMITER)
D601 1SS123
IC03 TL082CPS PWM CARRIER GENERATOR
1.5Vp-p DURING FOCUS SEARCH
IC504 NJM2901MB PWM COMPARATOR
IC506 MB3763PF PWM DRIVE (FOCUS)
D503 1S2835
INPUT LOGIC
OPTICAL PICK-UP BLOCK (1/2)
FOCUS COIL
FOCUS COIL RESISTANCE VALUE: APPROX. 8Ω
TRIANGULAR WAVE
IC502 NJM4558M BIAS LEVEL SETTING
IC505 NJM2901MB PWM COMPARATOR
IC503 TL082CPS 2.8Vp-p LIMITER
IC507 MB3763PF PWM DRIVE (TRACKING)
D504 1S2835
TRACKING COIL
TRACKING COIL RESISTANCE VALUE: APPROX. 8Ω
D505 1S2835
D511 1SS123
A B C D E F G H I J
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

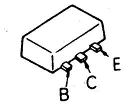

IC301 CX20133 D/A CONVERTER
IC101,201 TL072CP INTEGRATOR
IC302 μPD4053BG SWITCH
IC101,201 TL072CPS SAMPLE HOLD
[SUB BOARD]
IC102 NJM4560M LOWPASS FILTER
Q601,602 2SD1048 VOLT. REG
Q603 2SB624 VOLT. REG
IC602 MSM5128-20GS 16K BIT RAM
SUB-CODE DECODER
CRC CHECK
EFM DECODER
INTERPOLATION
PARALLEL/SERIAL CONVERTER
TIMING GENERATOR FROM VCO
ERROR DET, ERROR CORRECTION
TIMING GENERATOR FROM X'TAL
RAM ADDRESS GENERATOR
DECODER
2048 x 8 (16384) RAM CELL
SELECTOR
TTL-ECL INTERFACE CIRCUIT
HIGHER ORDER 8 BIT SHIFT REGISTER, LATCHES, COUNTER
LOWER ORDER 8 BIT SHIFT REGISTER, LATCHES, COUNTER
DISCHARGE DRIVE CIRCUIT(L)
DISCHARGE DRIVE CIRCUIT(R)
TIMING GENERATOR
256:1 CONSTANT CURRENT SOURCE
CLOCK BUFFER
ANALOG SWITCH DRIVE CIRCUIT
Q101,201 2SK300 DISCHARE
IC303 μPD4053BG SWITCH
IC304 NJM4560M DE-EMPHASIS
Q102,202 2SD1048 MUTING
IC202 NJM4560M LOWPASS FILTER
FL101 BPF
FL201 BPF
OPEN (NOT USED)
IC603 TL082CPS CLV SERVO CONTROL (INVERTER)
IC604 TL082CPS (LIMITER)
D601 ISS123
IC503 TL082CPS PWM CARRIER GENERATOR
D502 IS2835
Q501 2SD1048 BUFFER AMP
M901 DISC MOTOR (BHR-3000A)
PWM MODULATOR
Q507 2SD1048 RIPPLE FILTER
[LIQUID CRYSTAL MODULE (1/2)]
ND901 LCD
BATT
AMS
SEARCH
TRACK
TIME
OPTICAL PICK-UP BLOCK (1/2)
FOCUS COIL
FOCUS COIL RESISTANCE VALUE: APPROX. 8Ω
TRACKING COIL
TRACKING COIL RESISTANCE VALUE: APPROX. 8Ω
IC502 NJM4558M BIAS LEVEL SETTING
TRIANGULAR WAVE
IC509 TC4049BF FLYWHEEL CIRCUIT
Q502-505,511 2SD1048
D507,508 IS2835
D509,510 IS2835
IC505 NJM2901MB BATTERY LEVEL CHECK
D506 IS2835
IC505 NJM2901MB PWM COMPARATOR
IC503 TL082CPS LIMITER
D505 IS2835
D511 ISS123
IC508 MB3763PF PWM DRIVE(SLED)
INPUT LOGIC
S903 LIMIT (ON: FOP REACHES THE INNER POSITION.)
M902 SLED
Q506 DTA124EK SLED SWITCH
IC509 TC4049BF INVERTER
S902 OPEN/CLOSE (ON: THE DISC HOLDER IS SHUT.)
IC801 MB88541-130M SYSTEM CONTROL
D801 IS2835
POWER IS CONNECTED.
D803 RD5.6E-L2
Q801 DTA124EK SWITCHING
UK MODEL
PS302
DC-DC CONVERTER
POWER ON/OFF
S909 STOP
S908 FR
S907 FF
S906 PLAY/PAUSE
S905 MODE
S904 REMAIN
[LIQUID CRYSTAL MODULE (1/2)]
US MODEL ONLY
8.4672MHz
35.002MHz



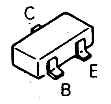
IC301 CX20133 D/A CONVERTER
IC101,201 TL072CPS INTEGRATOR
IC302 μPD4053BG SWITCH
IC101,201 TL072CPS SAMPLE HOLD
[SUB BOARD]
IC102 NJM4560M LOWPASS FILTER
TTL-ECL INTERFACE CIRCUIT
ANALOG SWITCH DRIVE CIRCUIT
HIGHER ORDER 8 BIT SHIFT REGISTER, LATCHES, COUNTER
LOWER ORDER 8 BIT SHIFT REGISTER, LATCHES, COUNTER
DISCHARGE DRIVE CIRCUIT(L)
DISCHARGE DRIVE CIRCUIT(R)
TIMING GENERATOR
256:1 CONSTANT CURRENT SOURCE
CLOCK BUFFER
Q101,201 2SK300 DISCHARGE
IC303 μPD4053BG SWITCH
IC304 NJM4560M DE-EMPHASIS
Q102,202 2SD1048 MUTING
Q103,203 2SD1048 HEADPHONE MUTING
OPEN (NOT USED)
L-CH OUTPUT
R-CH OUTPUT
GND
TO TRANSLATION BOARD (B)
(NOT USED)
FL101 BPF
FL201 BPF
IC202 NJM4560M LOWPASS FILTER
Q302,303 2SD1048 VOLT. REG
[LIQUID CRYSTAL MODULE (1/2)]
ND901 LCD
BATT
AMS
SEARCH
TRACK
TIME
PWM MODULATOR
Q507 2SD1048 RIPPLE FILTER
IC505 NJM2901MB BATTERY LEVEL CHECK
D509,510 1S2835
D506 1S2835
IC801 MB88541-130M SYSTEM CONTROL
D801 1S2835
UK MODEL
PS302
Q301 2SB798 VOLT. REG
Q304,305 2SB624 VOLT. REG
Q306 2SD999 VOLT. REG
Q307 DTA124EK POWER ON/OFF SWITCH
Q308 DTC124EK SWITCH
Q309 DTA124EK INVERTER
IC802 S81250-HG VOLT. REG
D803 RD5.6E-L2
D802 1S2835 RESET SIGNAL PRODUCE
Q801 DTA124EK SWITCHING
VOLT. REG
CP301 DC-DC CONVERTER
DC-DC CONVERTER
POWER ON/OFF
US, CANADIAN AEP, E MODEL
CD MUTE PAUSE ON+5V
V DRIVE
CD +5V
B+
GND
ON/OFF CD FWD
TOTAL CURRENT
●STOP: 390mA
●DURING FOCUS SEARCH: 410-420mA
●CLVS: 560-580mA (CLV RUN-UP MODE)
●PLAY: 440mA
S909 STOP
S908 (FR)
S907 (FF)
S906 (PLAY/PAUSE)
S905 MODE
S904 REMAIN
S903 LIMIT (ON: FOP REACHES THE INNER POSITION.)
M902 SLED
S902 OPEN/CLOSE (ON: THE DISC HOLDER IS SHUT.) (5V: S903 OFF 0V: S903 ON)
Q506 DTA124EK SLED SWITCH
IC509 TC4049BF INVERTER
POWER IS CONNECTED.
APPROX. 2S

- **Semiconductor Lead Layouts**

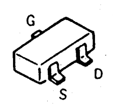
2SB798
2SD999



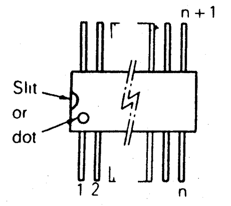
2SB624-BV5
2SD1048X6
DTA124EK
DTC124EK



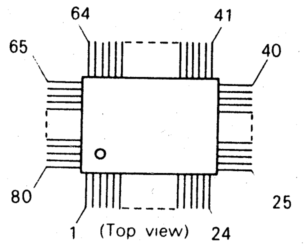
2SK300



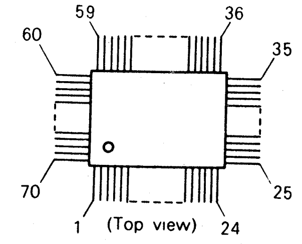
CX20108
CX20109
CX20133
HM6116EP-3
MB3763PF
NJM2901MB
NJM4558M
NJM4560M
TC4015BF
TC4027BF
TC4030BF
TC4049BF
TL072CPS
TL082CPS
μPD4053BG


n+1
Slit
or
dot
1 2
n

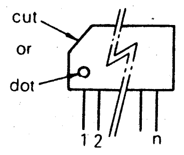
CX23035


64
41
65
40
80
25
1 (Top view) 24

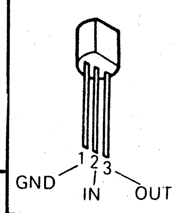
MB88541-130M


59
36
60
35
70
25
1 (Top view) 24

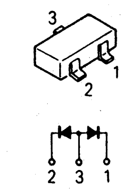
NJM4560S


cut
or
dot
1 2
n

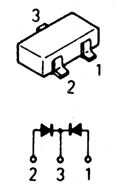
S81250HG


GND
1 2 3
IN
OUT

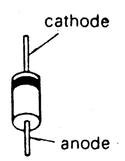
1S2835



1S2837



1SS106
HZ2ALL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anode

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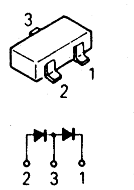

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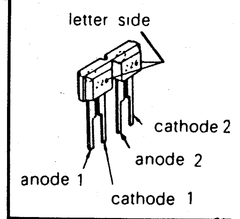
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cathode 2
anode 2
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cathode 1

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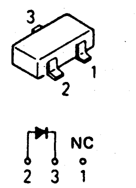
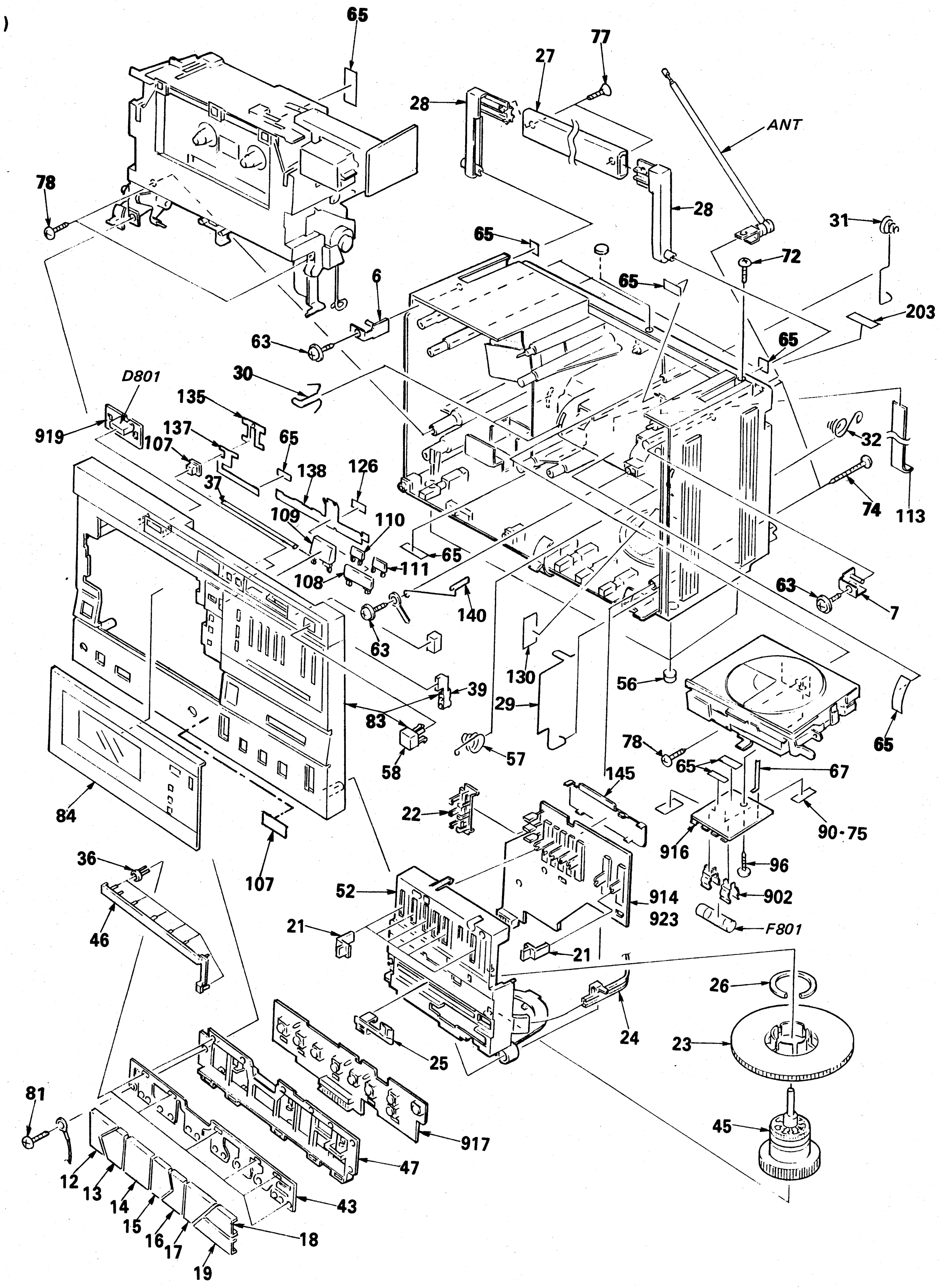


SECTION 5

EXPLODED VIEW AND PARTS LIST

- NOTE: REFER TO THE FOLLOWING PART LISTS.

(1)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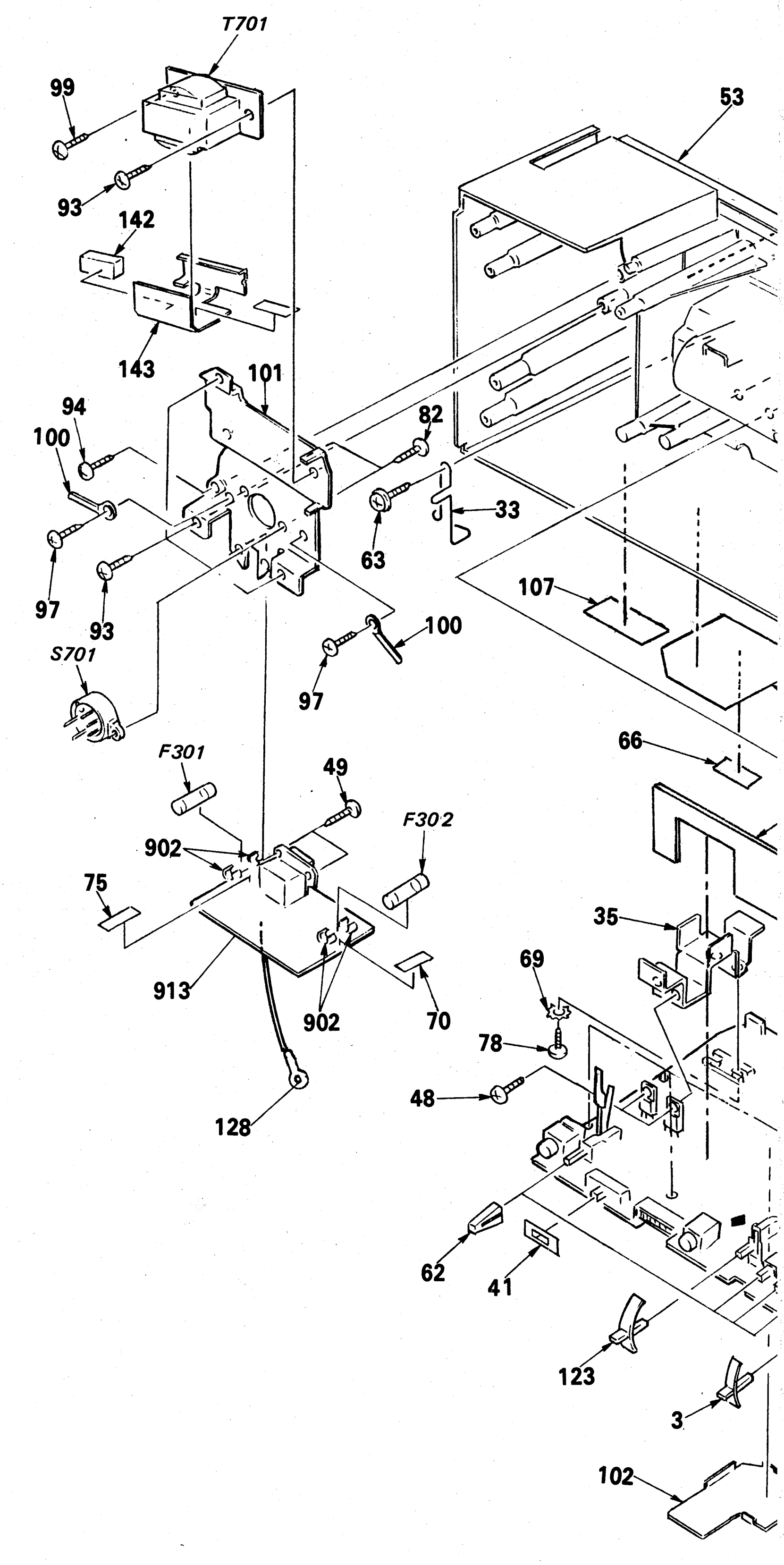
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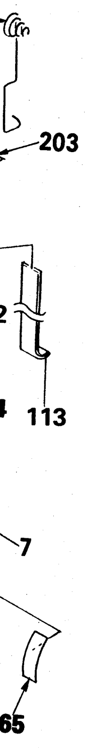

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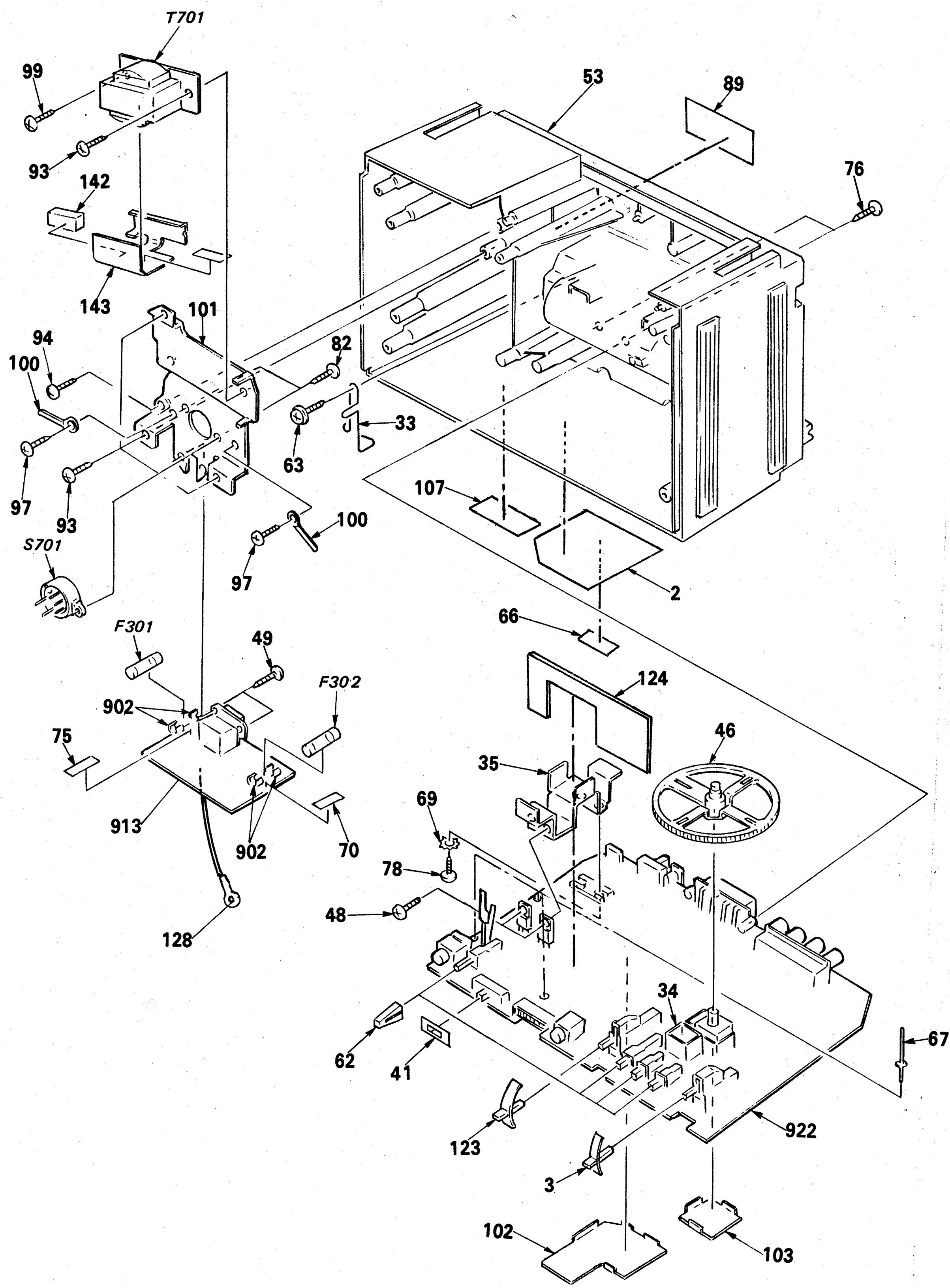
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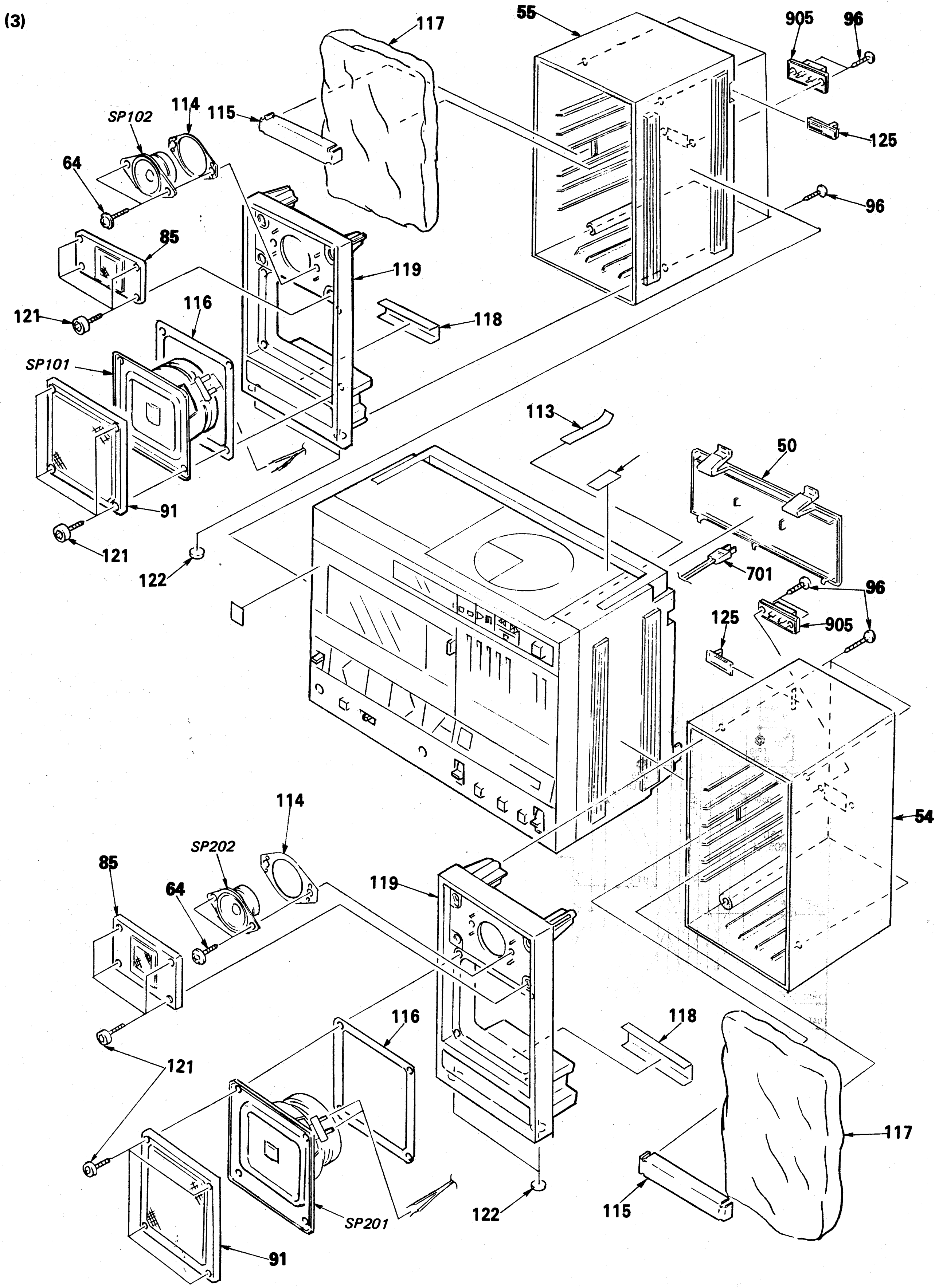
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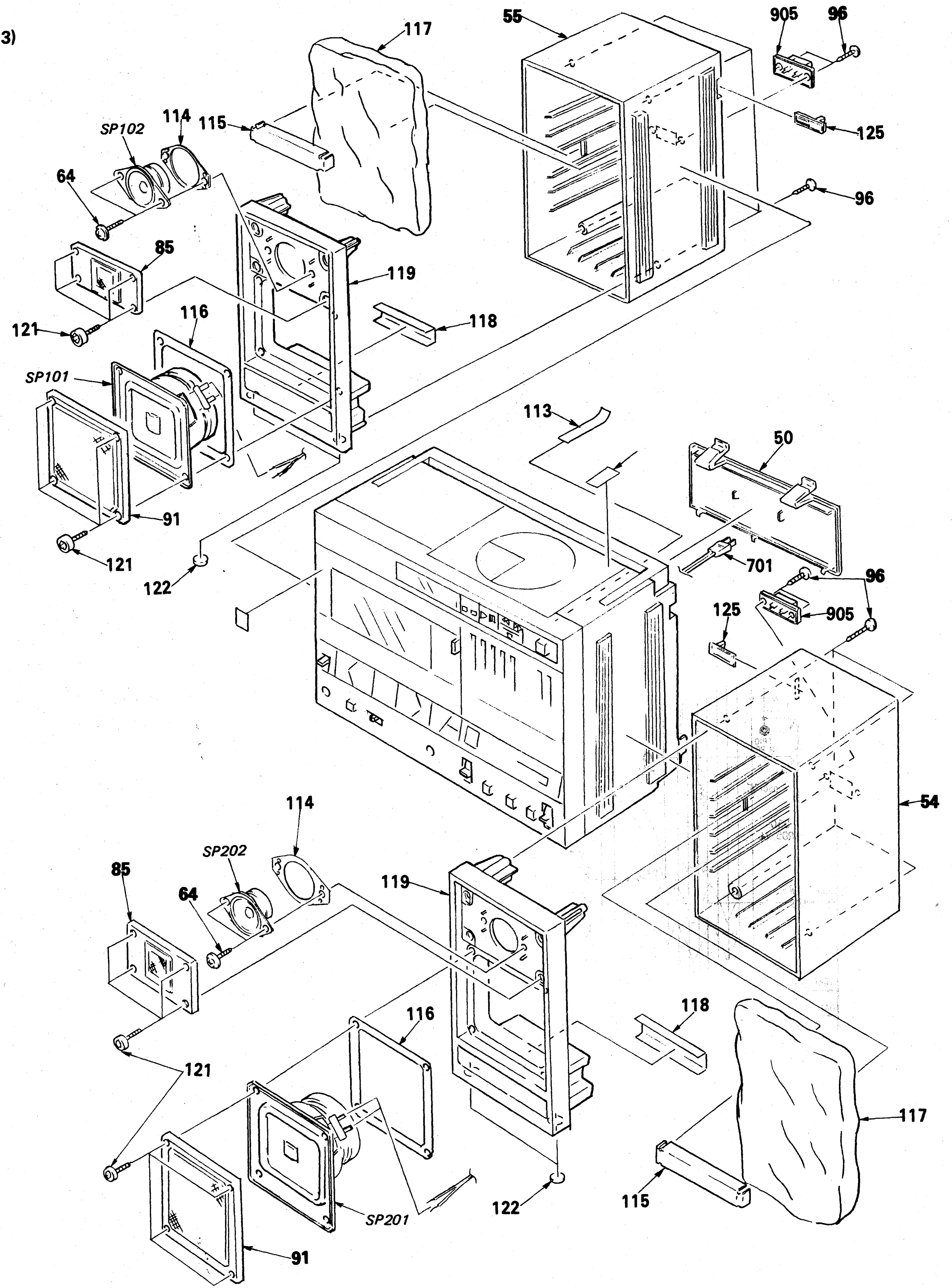
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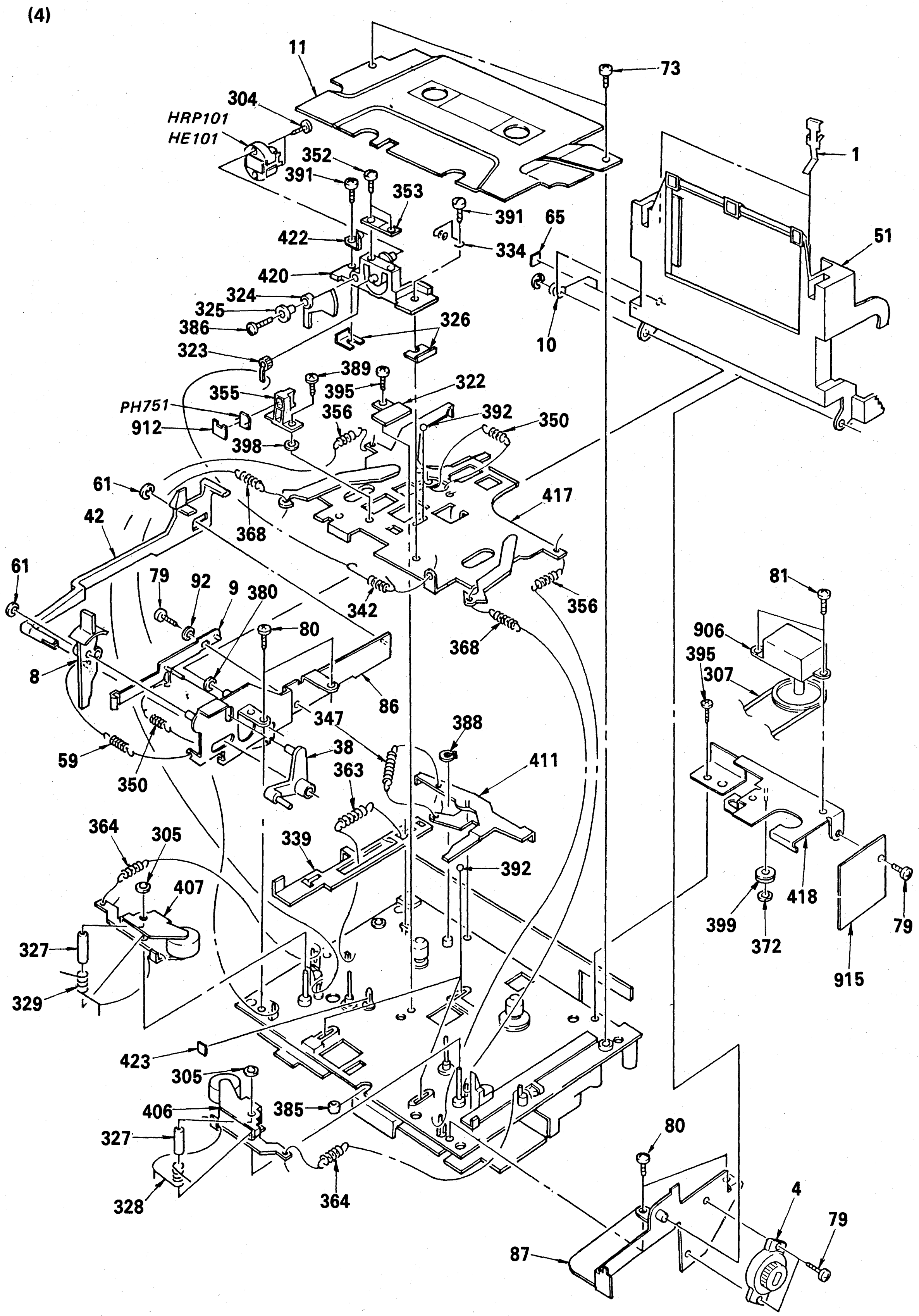
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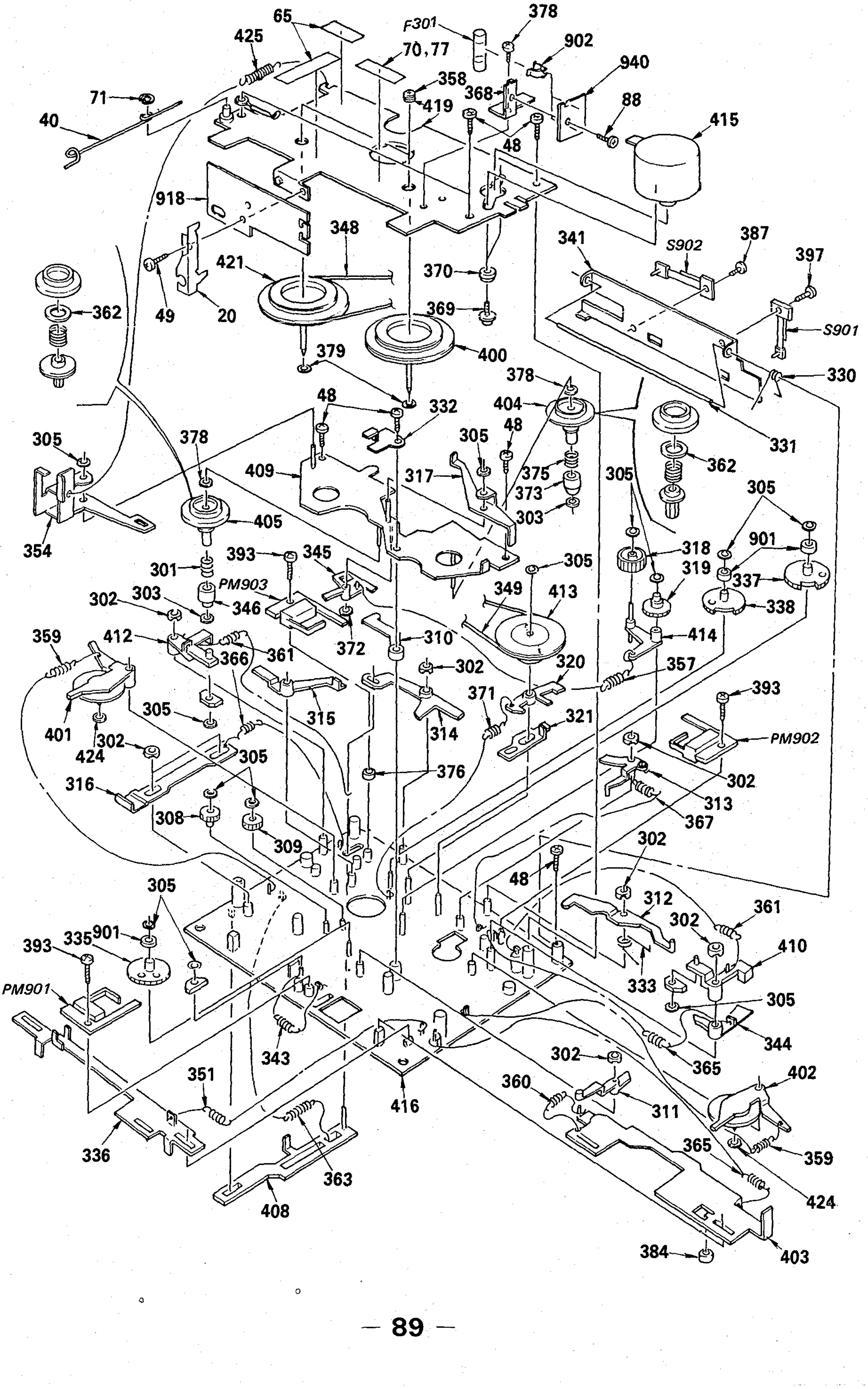
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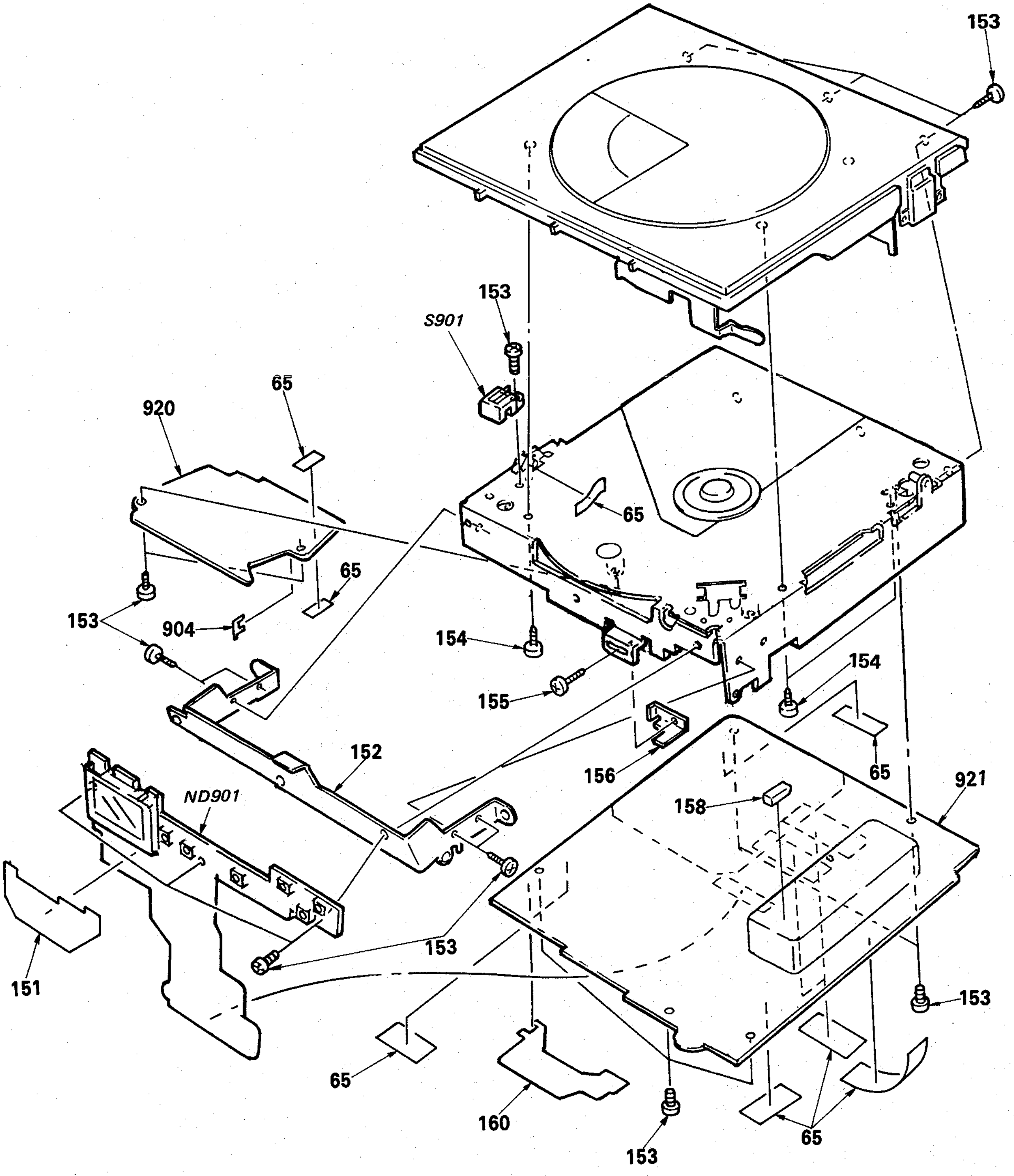
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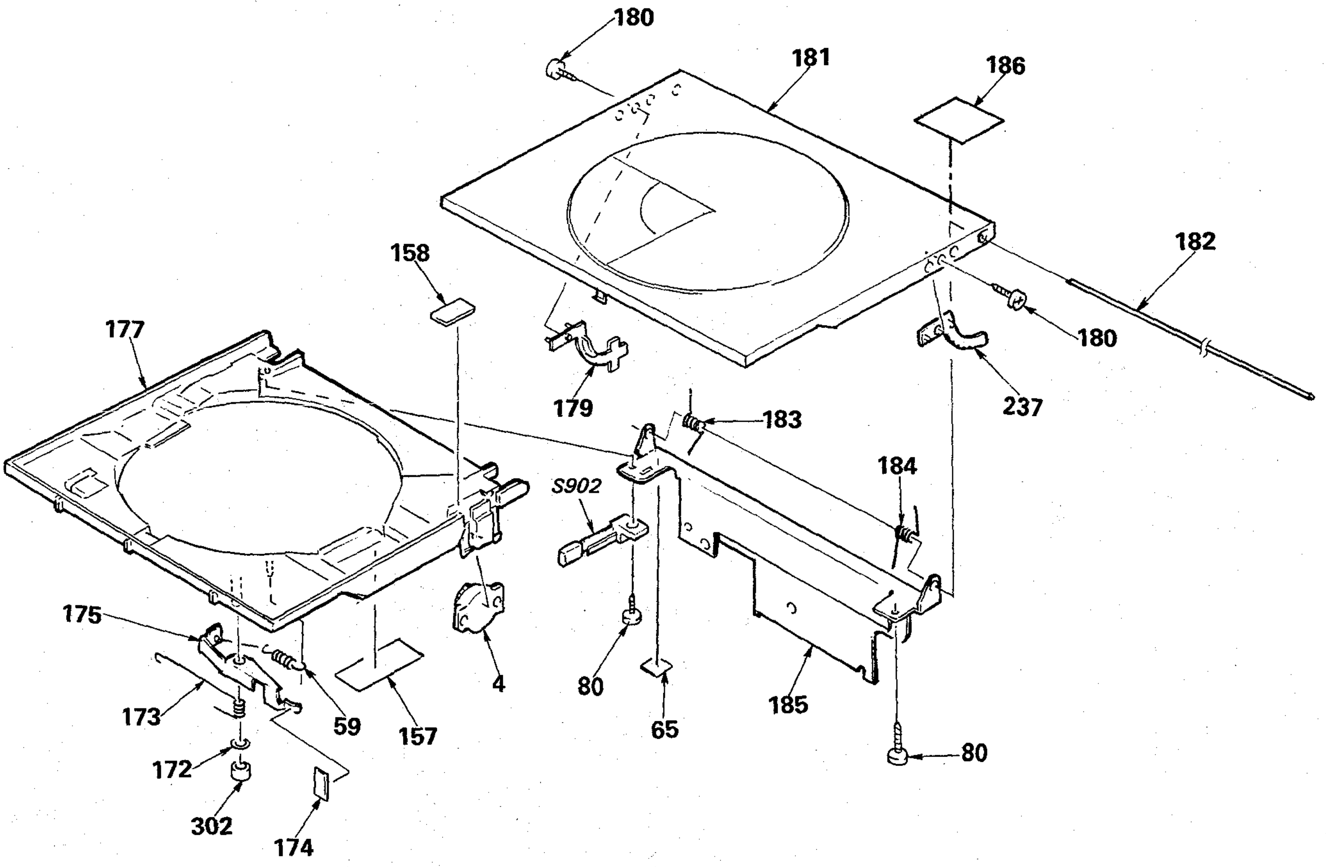
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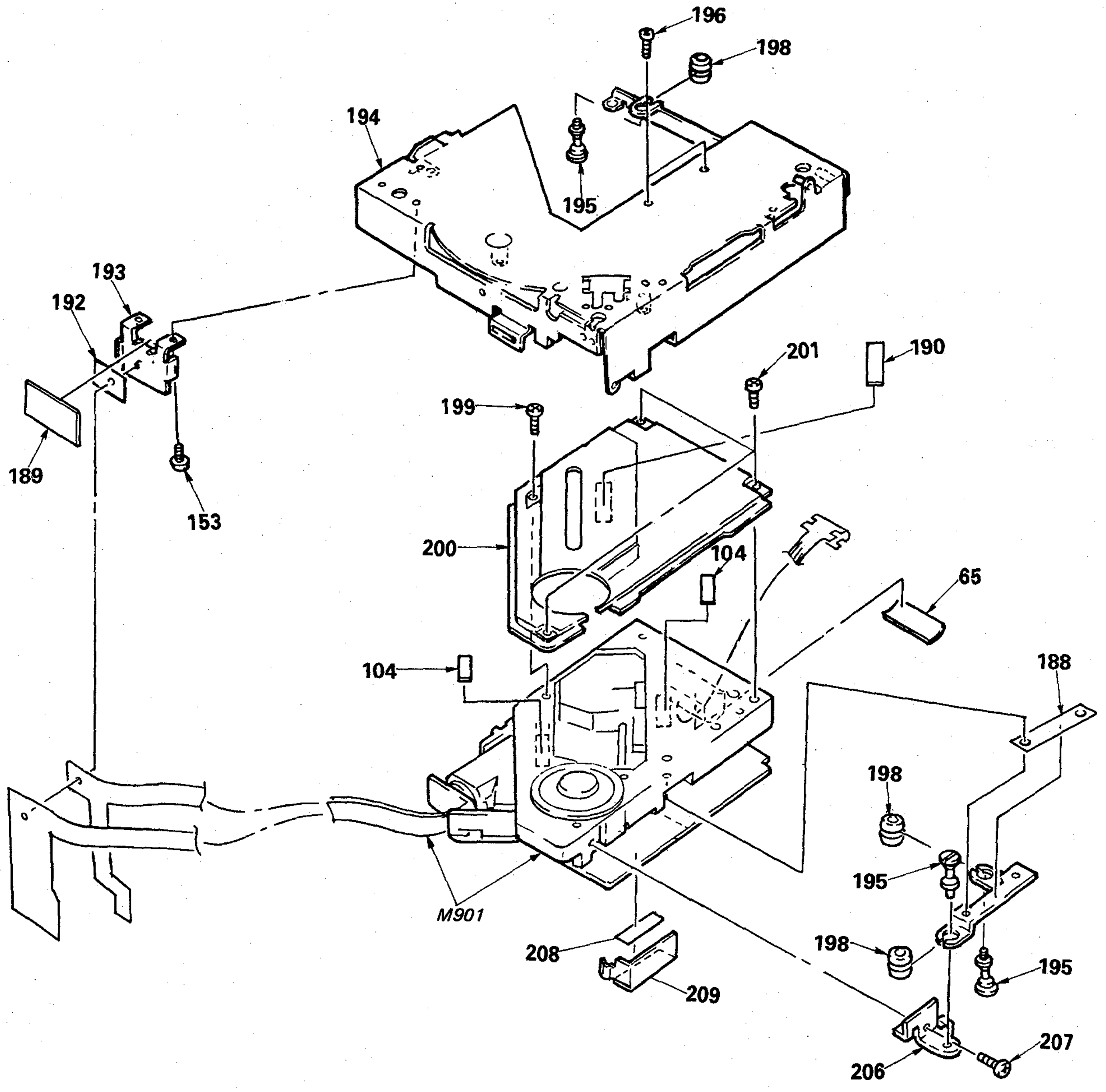
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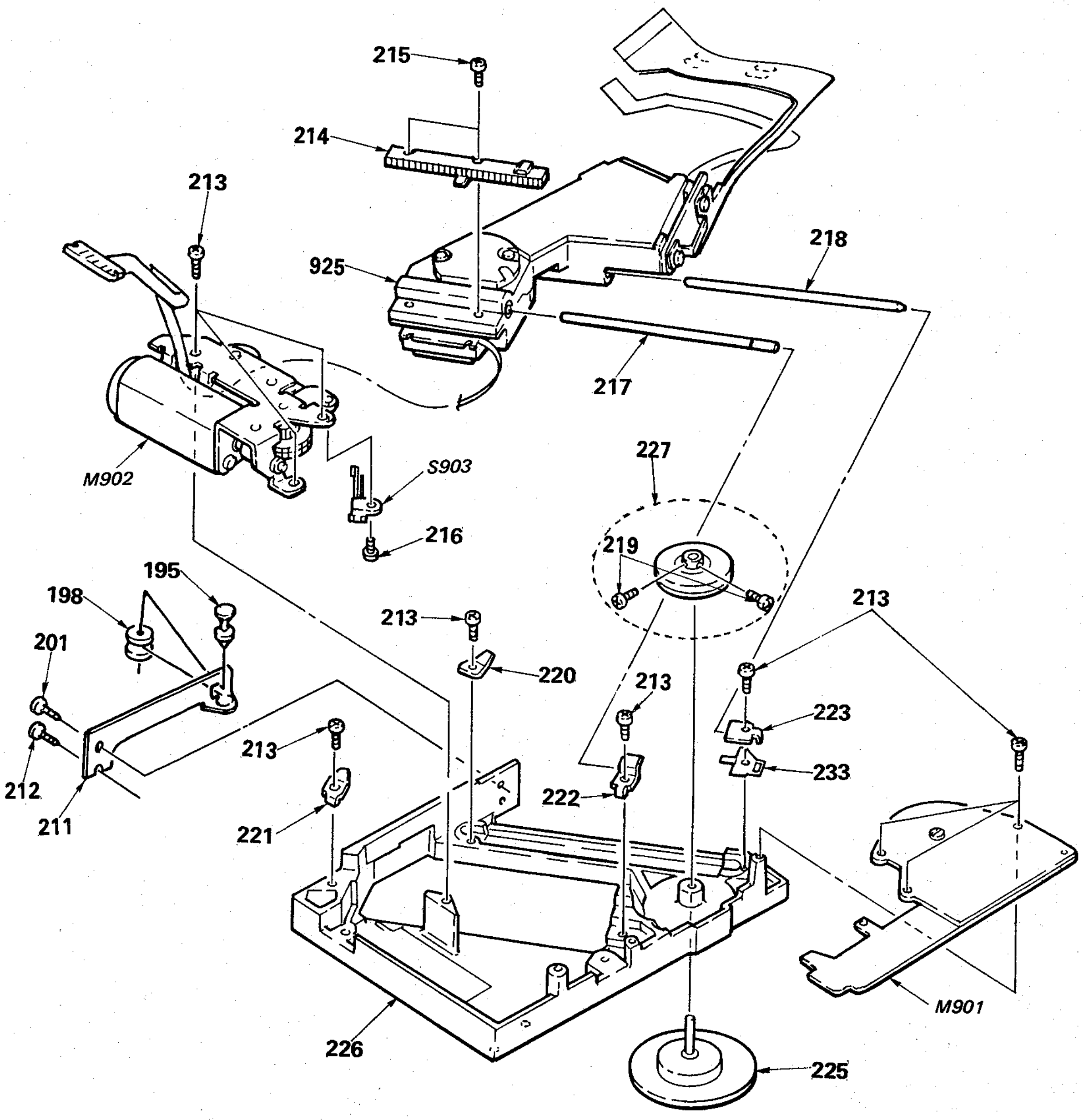
M902
S903
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NOTE:
The mechanical parts with no reference number in the exploded views are not supplied.

- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- The construction parts of an assembled part are indicated with a collation number in the remark column.

No.	Part No.	Description	Remarks
1	3-308-823-11	SPRING	
2	*4-910-288-01	(US,Canadian)...LABEL, MODEL NUMBER	
	*4-910-292-01	(AEP)...........LABEL, MODEL NUMBER	
	*4-910-293-01	(G-AEP).........LABEL, MODEL NUMBER	
	*4-910-294-01	(UK)............LABEL, MODEL NUMBER	
	*4-910-296-01	(E).............LABEL, MODEL NUMBER	
3	3-314-109-00	KNOB, LEVER	
4	3-319-224-11	DAMPER, SMALL	
6	*X-4910-203-1	BRACKET (B) ASSY, HANDLE	
7	*X-4910-202-1	BRACKET (A) ASSY, HANDLE	
8	3-320-205-11	LEVER (B), EJECT	
9	3-320-206-01	PLATE, LOCK, EJECT	
10	4-910-287-01	SPRING	
11	*3-320-208-01	COVER, MD	
12	3-320-210-11	BUTTON, REW	
13	3-320-211-11	BUTTON, REV	
14	3-320-212-11	BUTTON, STOP	
15	3-320-213-11	BUTTON, FWD	
16	3-320-214-11	BUTTON, FF	
17	3-320-215-11	BUTTON, REC	
18	3-320-216-11	BUTTON, PAUSE	
19	3-320-217-11	BUTTON, REC MUTE	
20	*3-320-218-01	SUPPORT	
21	3-320-221-21	KNOB, CONTROL	
22	*3-320-222-01	HOLDER, LED	
23	3-320-223-11	KNOB, TUNING	

No.	Part No.	Description	Remarks
24	3-320-224-01	RACK, POINTER	
25	3-320-225-01	POINTER	
26	3-320-226-01	SPRING	
27	4-910-230-01	HANDLE	
28	4-910-231-01	PLATE, SIDE, HANDLE	
29	*4-910-206-01	SPRING	
30	4-910-247-01	TERMINAL, PLUS	
31	4-910-205-01	SPRING	
32	3-320-232-01	SPRING	
33	4-910-204-01	SPRING	
34	*3-320-277-01	PLATE (E), SHIELD	
35	*3-320-236-01	HEAT SINK	
36	3-320-237-01	RIVET	
37	*4-910-213-01	SHAFT, BUTTON	
38	3-320-239-01	LEVER, SWITCH	
39	3-320-240-01	LEVER, RESET	
40	3-320-242-01	SPRING	
41	*3-320-243-01	PLATE, BLIND, SWITCH	
42	3-320-245-01	LEVER, EJECT	
43	3-320-246-01	PLATE, SPRING, BUTTON	
44	3-320-247-11	RETAINER, SPRING	
45	3-320-248-01	GEAR, TUNING	
46	3-320-249-01	GEAR, TUNING CAPACITOR	
47	*3-320-251-11	CHASSIS, BUTTON	
49	7-685-792-04	SCREW +PTT 2.6X6 (S)	
50	3-320-253-31	LID, BATTERY CASE	

No.	Part No.	Description	Remarks
51	*3-320-254-01	HOLDER, CASSETTE	
52	*3-320-255-01	CHASSIS, CONTROL	
53	4-910-240-01	(AEP,UK)........CABINET (REAR)	
	4-910-240-12	(US,Canadian)...CABINET (REAR)	
	4-910-240-22	(E).............CABINET (REAR)	
54	4-910-255-01	BOX, SPEAKER	
55	4-910-255-11	BOX, SPEAKER	
56	3-319-824-01	FOOT	
57	4-910-248-01	TERMINAL, MINUS	
58	4-910-203-01	BUTTON, OPEN	
59	3-489-093-00	SPRING, TENSION	
61	3-320-276-01	WASHER, STOPPER	
62	3-572-077-11	BUTTON, REC MUTE	
63	3-703-135-00	SCREW, TAPPING	
64	3-703-136-00	SCREW, TAPPING	
65	3-831-441-XX	CUSHION, SPEAKER	
66	3-701-999-02	(US)...LABEL, SERIAL NUMBER	
67	*3-847-723-00	PIN, LEAD	
68	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3	
69	7-623-422-07	LW 3, TYPE B	
70	*3-701-946-28	(US,Canadian)...LABEL, FUSE	
	*3-701-948-13	(E,AEP,UK)......LABEL, FUSE	
71	7-624-106-04	STOP RING 3.0, TYPE -E	
72	7-682-549-09	SCREW +B 3X10	
73	7-685-104-14	SCREW +PTP 2.0X6 TYPE2 SLIT	
74	7-685-154-14	SCREW +P 3X35 TYPE2 NON-SLIT	
75	*3-701-946-22	(US,Canadian)...LABEL, FUSE	
	*3-701-948-12	(AEP,UK)........LABEL, FUSE	
	*3-701-948-22	(E,AEP,UK)......LABEL, FUSE	

No.	Part No.	Description	Remarks
76	7-685-247-19	SCREW +KTP 3X10 TYPE2 NON-SLIT	
77	*3-701-946-34	(US,Canadian)...LABEL, FUSE	
78	7-685-648-11	SCREW +BVTP 3X12 TYPE2 N-S	
79	7-685-781-04	SCREW +BVTT 2X4 (S)	
80	7-685-105-19	SCREW +P 2X8 TYPE2 NON-SLIT	
81	7-685-852-01	SCREW +BVTT 2X5 (S)	
82	7-627-556-37	SCREW, PRECISION +P 2.6X4 TYPE 1	
83	X-4910-207-2	(E).............CABINET ASSY, FRONT	
	X-4910-208-2	(US,Canadian)...CABINET ASSY, FRONT	
	X-4910-209-2	(AEP,UK)........CABINET ASSY, FRONT	
	X-4910-210-2	(G-AEP).........CABINET ASSY, FRONT	
84	X-4910-205-1	LID ASSY, CASSETTE	
85	A-3239-356-A	ESCUTCHEON ASSY, TWEETER	
86	*X-3320-201-1	BEARING (A) ASSY, LID	
87	*X-3320-202-1	BEARING (B) ASSY, LID	
88	7-685-852-01	SCREW +BVTT 2X5 (S)	
89	*3-703-043-21	(UK)...LABEL, CAUTION, MAIN	
90	*3-701-948-14	(E,AEP,UK)...LABEL, FUSE	
91	A-3239-357-A	ESCUTCHEON ASSY, WOOFER	
92	7-688-001-11	W 2, MIDDLE	
93	7-685-660-14	SCREW +BVTP 4X10 TYPE2 SLIT	
94	7-685-659-29	SCREW +BVTP 4X8 TYPE2 SLIT	
95	7-685-648-19	SCREW +BVTP 3X12 TYPE2 N-S	
96	7-685-648-79	SCREW +BVTP 3X12 TYPE2 IT-3	
97	7-685-645-71	SCREW +BVTP 3X6 TYPE2 IT-3	
98	7-682-559-04	SCREW +B 4X5	
100	*3-701-748-00	CLAMP	

No.	Part No.	Description	Remarks
101	*4-910-229-01	CHASSIS, POWER	
102	*4-910-279-01	SHIELD, PC BOARD	
103	*3-320-263-01	PLATE (B), SHIELD	
104	9-911-837-XX	SPACER	
105	9-911-838-XX	CUSHION	
106	4-907-033-11	BUTTON, REMAIN MODE	
107	*4-885-838-01	(AEP,UK)...LABEL, CLASS 1	
108	4-907-060-01	BUTTON, STOP	
109	4-907-057-01	BUTTON, PLAY PAUSE	
110	4-907-059-01	BUTTON, FR	
111	4-907-058-01	BUTTON, FF	
113	9-911-816-01	CLOTH, BATTERY DRAWER	
114	3-325-817-01	CUSHION, TWEETER	
115	*3-319-221-01	REINFORCEMENT	
116	3-319-833-01	CUSHION, WOOFER	
117	*3-319-289-01	ABSORBENT, ACOUSTIC	
118	3-319-294-01	NET, DUCT	
119	3-325-814-11	BOARD, BAFFLE, SPEAKER	

No.	Part No.	Description	Remarks
121	3-319-204-01	SCREW (A), ORNAMENTAL	
122	3-319-288-01	FOOT	
123	4-910-208-01	KNOB, FUNCTION	
124	*4-911-801-01	(E,AEP,UK)...STOPPER, LEAD	
125	3-319-266-01	CLAW, SPK LOCK	
126	3-560-308-00	SHEET (B), INSULATING	
127	*4-910-251-01	LABEL, SPEAKER	
128	7-623-510-01	LUG, 4	
130	*4-885-843-02	(AEP)....LABEL, CAUTION, LASER	
135	4-910-254-01	PLATE, RETURN, REMAIN BUTTON	
137	4-910-274-01	PLATE (B), SHIELD, ELECTROSTATIC	
138	*4-910-253-01	SPRING	
140	*4-910-271-01	SPRING	
141	7-685-648-71	SCREW +BVTP 3X12 TYPE2 IT-3	
142	9-911-843-XX	CUSHION	
143	*4-910-295-01	PLATE, SHIELD	
145	*4-910-289-01	SHIELD, GRAPHIC EQUALIZER	

No.	Part No.	Description	Remarks
151	4-910-280-01	SHEET, FLEXIBLE COVER	
153	7-627-850-27	SCREW, PRECISION +P 1.4X3	
154	7-685-103-14	SCREW +P 2X5 TYPE2 NON-SLIT	
155	7-621-773-86	SCREW +B 2.6X4	
156	*4-910-267-01	REINFORCEMENT	
157	*3-703-044-26	(US,Canadian)...LABEL, FUSE CAUTION	
158	9-911-840-XX	CUSHION, LID	
160	4-907-077-01	FOIL, SHIELD	
161	*4-910-283-01	RETAINER, LCD	
172	3-701-441-11	WASHER	
173	4-910-212-01	SPRING	
174	9-911-863-XX	FIBER (A)	
175	*4-910-211-01	LEVER, OPEN	
177	4-910-241-01	CABINET, CD	
179	4-910-246-02	ARM, CD	
180	7-685-204-19	SCREW +KTP 2X6 TYPE2 NON-SLIT	
181	X-4910-204-1	LID SUB ASSY, CD	

No.	Part No.	Description	Remarks
182	4-910 214-01	SHAFT, LID	
183	4-910-225-01	SPRING (B)	
184	4-910-215-01	SPRING	
185	*4-910-233-01	BRACKET (A)	
186	3-703-707-41	STICKER, SONY SYMBOL (21)	
188	*4-908-789-01	SPACER, HOLDER	
189	9-911-815-01	CUSHION	
190	4-908-711-01	LABEL, CAUTION, LENS	
192	7-632-205-01	SHEET, ADHESIVE, FLEXIBLE	
193	*4-907-035-01	HOLDER, FLEXIBLE	
194	*X-4910-201-1	CHASSIS ASSY, MAIN	
195	4-908-754-01	SCREW	
196	7-627-551-58	SCREW, PRECISION +P 1.4X3	
198	4-908-755-01	INSULATOR (2001)	
199	3-703-816-02	SCREW (M1.4X2.0), SPECIAL HEAD	
200	4-908-750-01	COVER, MD	

No.	Part No.	Description	Remarks
201	7-627-553-38	SCREW, PRECISION +P 2X3	
203	3-527-213-00	(E,Canadian,UK,AEP)..LABEL, SERIAL NUMBER	
205	4-907-040-01	HOLDER (B), INSULATOR	
206	4-907-050-01	HOLDER (C), INSULATOR	
207	7-627-850-68	SCREW, PRECISION +P 1.4X4	
208	3-563-105-00	SHEET, INSULATING, MOTOR PCB	
209	*4-907-076-01	PLATE, SHIELD, CLV	
211	4-907-039-01	HOLDER (A), INSULATOR	
212	7-627-452-17	SCREW, PRECISION +K 2X3	
213	3-703-816-11	SCREW (M1.4X4.0), SPECIAL HEAD	
214	3-320-121-01	RACK	
215	7-627-552-77	SCREW, PRECISION +P 1.7X6	
216	7-627-553-37	SCREW, PRECISION +P 2X3	
217	3-320-106-01	SHAFT (A)	
218	3-320-107-01	SHAFT (B)	

No.	Part No.	Description	Remarks
219	2-622-805-01	SCREW	
220	3-320-104-01	RETAINER (C)	
221	3-320-103-01	RETAINER (B)	
222	3-320-102-01	RETAINER (A)	
223	3-320-105-01	RETAINER (D)	
225	X-3320-101-1	TURNTABLE ASSY	
226	*X-3320-103-3	CHASSIS ASSY	
227	X-2622-803-1	ROTOR ASSY	
231	*4-910-234-01	BRACKET (B)	
232	7-623-110-01	W 4, SMALL	
233	3-320-130-01	SPRING (A), LEAF	
234	3-320-133-01	SPACER, RACK	
235	7-624-102-04	STOP RING 1.5, TYPE -E	
236	7-627-553-27	SCREW, PRECISION +P 2X2.5	
237	4-910-216-01	GEAR, R	

No.	Part No.	Description	Remarks
301	3-306-302-00	SPRING, COMPRESSION	
302	3-307-390-00	BUSHING, LOADING SPRING	
303	3-307-394-00	RETAINER (B), THRUST	
304	3-307-831-00	SCREW, PANEL	
306	3-307-948-11	WASHER, NYLON	
307	3-308-460-00	BELT, CAPSTAN	
308	3-313-708-00	GEAR, DECELERATION	
309	3-313-709-00	GEAR, REVERSE	
310	3-313-710-00	LEVER, FWD	
311	3-313-713-00	LEVER, NR	
312	3-313-716-00	LEVER, FF	
313	3-313-718-00	LEVER, REC TRIGGER	
314	3-313-720-00	LEVER, REW	
315	3-313-723-00	LEVER, NR TRIGGER	
316	*3-313-724-00	SLIDER, NR TRIGGER	
317	3-313-733-00	LEVER (A), REC	
318	3-313-744-00	GEAR, FR	
319	3-313-745-00	GEAR, REW	
320	3-313-746-00	LEVER, AMS LOCK	
321	*3-313-747-00	SLIDER, GEAR RELEASE	
322	3-313-749-00	SPRING, LEAF	
323	3-313-851-01	GEAR, HEAD	
324	3-313-755-00	GEAR, FAN MOLD	
325	3-313-756-00	COLLAR (G)	
326	3-313-757-01	SHIM (F), HEAD	
	3-313-757-11	SHIM (F), HEAD	
	3-313-757-21	SHIM (F), HEAD	

No.	Part No.	Description	Remarks
327	3-313-759-01	COLLAR (P)	
328	3-313-762-01	SPRING (N)	
	3-313-762-11	SPRING (N)	
	3-313-762-21	SPRING (N)	
329	3-313-763-11	SPRING (R)	
	3-313-763-11	SPRING (R)	
	3-313-763-11	SPRING (R)	
330	3-313-784-00	SPRING	
331	*3-313-785-00	SHAFT, DETECTION LEVER	
332	*3-313-786-00	RETAINER, SLIDER	
333	3-313-787-00	SPRING	
334	3-313-791-00	CLAMP	
335	3-313-792-00	GEAR, FWD CAM	
336	*3-313-794-00	SLIDER (B), NR	
337	3-313-795-00	GEAR, FF CAM	
338	3-313-796-00	GEAR, REW CAM	
339	3-313-798-00	SLIDER (R), PAUSE	
341	*3-313-803-12	LEVER, DETECTION	
342	3-313-807-00	SPRING (POWER TENSION), TENSION	
343	3-313-808-00	SPRING, TENSION	
344	3-313-811-00	BRAKE (S)	
345	3-313-812-00	BRAKE (T)	
346	3-313-814-00	CLAW (T), REEL	
347	3-313-815-00	SPRING, TENSION	
348	3-313-816-00	BELT, SQUARE (71X1.3)	
349	3-313-823-00	BELT, SQUARE (55.6X1.3)	
350	3-313-824-00	SPRING, TENSION	

No.	Part No.	Description	Remarks
351	3-313-849-01	SPRING, TENSION	
352	3-313-841-01	SCREW, ADJUSTMENT	
353	3-313-842-01	SPRING, LEAF	
354	3-313-846-01	LEVER (C), REC	
355	3-319-287-01	GUIDE, TAPE	
356	3-313-811-00	BRAKE (S)	
357	3-515-169-11	SPRING, TENSION	
358	3-489-073-00	SCREW, THRUST	
359	3-507-111-00	SPRING, TENSION	
360	3-515-167-00	SPRING, TENSION	
361	3-534-558-00	SPRING, TENSION	
362	3-535-625-00	WASHER, HANDLE	
363	3-539-234-00	SPRING, TENSION	
364	3-542-475-00	SPRING, TENSION	
365	3-542-481-00	SPRING, TENSION	
366	3-545-542-00	SPRING, TENSION	
367	3-547-668-00	SPRING, TENSION	
368	*4-910-291-01	BRACKET, FUSE BOARD	
369	3-570-027-00	SCREW, MOTOR	
370	3-570-118-00	CUSHION, MOTOR	
371	3-570-552-00	SPRING, TENSION	
372	3-570-615-00	POLY-WASHER (DIA.1.2)	
373	3-571-844-00	CRAW, REEL	
374	3-571-850-00	SPRING, COMPRESSION	

No.	Part No.	Description	Remarks
375	3-571-850-12	SPRING, COMPRESSION	
	3-571-850-21	SPRING, COMPRESSION	
376	3-652-612-21	CUSHION (B)	
377	3-701-437-11	WASHER	
378	7-627-553-28	SCREW +P 2X2.5	
379	3-701-438-11	WASHER, 2.5	
380	3-701-439-11	WASHER	
381	3-701-445-11	WASHER, 7	
382	3-885-228-00	CUSHION (B)	
384	3-538-051-00	RUBBER, BRAKE	
385	4-874-259-00	RUBBER, SHOCK ABSORBING	
386	7-621-255-55	SCREW +P 2X8	
387	7-621-772-18	SCREW +B 2X4	
388	7-624-193-08	STOP RING 3, GRIP	
389	7-627-553-28	SCREW, PRECISION +P 2X2.5	
390	7-627-556-48	SCREW +P 2.6X4.5	
392	7-671-111-11	BALL, STEEL 1.5MM	
393	7-685-105-14	TPG +P 2X8, TYPE 2, NON-SLIT	
395	3-307-948-01	WASHER, NYLON	
397	7-685-852-04	SCREW +BVTT 2X5 (S)	
398	7-688-001-13	W 2, MIDDLE	
399	X-3313-308-1	PULLEY, MOTOR	
400	X-3313-732-1	FLYWHEEL (N) ASSY	

No.	Part No.	Description	Remarks
401	X-3313-705-0	LEVER (N) ASSY, IDLER	
402	X-3313-706-0	LEVER (R) ASSY, IDLER	
403	X-3313-707-0	SLIDER (A) ASSY, NR	
404	X-3313-708-0	TABLE ASSY, REEL, SUPPLY	
405	X-3313-709-0	TABLE ASSY, REEL, TAKE-UP	
406	X-3313-710-0	PINCH LEVER (N) SUB ASSY	
407	X-3313-711-0	PINCH LEVER (R) SUB ASSY	
408	X-3313-712-0	SLIDER (N) ASSY, PAUSE	
409	X-3313-716-0	CHASSIS SUB ASSY, SUB	
410	X-3313-717-0	LEVER SUB ASSY, FF LOCK	
411	X-3313-718-2	LEVER ASSY, PAUSE	
412	X-3313-719-0	LEVER SUB ASSY, REW LOCK	
413	X-3313-720-0	PULLEY ASSY, FR	
414	X-3313-722-0	LEVER (B) ASSY, FR	
415	X-3313-723-0	MOTOR SUB ASSY	

No.	Part No.	Description	Remarks
416	*X-3313-733-1	CHASSIS ASSY, MECHANICAL	
417	X-3313-728-1	BASE SUB ASSY, HEAD	
418	X-3313-730-1	BRACKET ASSY, COUNTER	
419	*X-3313-731-1	RETAINER ASSY, THRUST	
420	X-3319-204-1	BRACKET ASSY, HEAD	
421	X-3313-703-0	FLYWHEEL ASSY	
422	*3-313-790-00	CLAMP	
423	3-319-286-01	SHEET, REFLECTION	
424	3-445-074-01	WASHER	
425	3-533-223-11	SPRING, TENSION	
426	3-554-222-00	WASHER (2), CAPSTAN	
427	7-627-556-38	SCREW +P 2.6X4.0	
428	3-313-850-01	SPRING, TENSION	
429	7-685-790-04	SCREW +BVTT 2.6X4 (S)	
430	*3-313-800-00	RETAINER, THRUST	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC,
UPD...: μPD...

ELECTRICAL PARTS

Ref.No.	Part No.	Description
901	1-452-202-00	MAGNET
902	1-533-162-00	HOLDER, FUSE
903	*1-535-243-21	CONTACT, CONNECTOR
904	*1-535-511-11	FRAME, LEAD (F TYPE)
905	1-536-833-11	TERMINAL BOARD (SPEAKER)
906	1-548-564-31	COUNTER, TAPE (SMALL TYPE)
907	*1-561-148-00	HOUSING, CONNECTOR 4P
908	*1-561-557-00	CONTACT, RECEPTACLE
909	*1-561-586-00	HOUSING, CONNECTOR 5P
910	*1-561-587-00	HOUSING, CONNECTOR 6P
911	*1-561-588-00	HOUSING, CONNECTOR 8P
912	1-612-589-11	PC BOARD, LEADER DETECTION
913	*1-615-405-00	PC BOARD, POWER
914	*1-615-406-00	PC BOARD, CONTROL
915	*1-615-407-00	PC BOARD, SHUT OFF
916	*1-615-408-00	PC BOARD, TRANSLATION (B)
917	*1-615-409-00	PC BOARD, BUTTON
918	*1-615-410-00	PC BOARD, TRANSLATION (A)
919	*1-615-411-00	PC BOARD, LED
920	*A-3015-294-A	(CD PLAYER)...PC BOARD ASSY, SUB
921	*A-3070-134-A	(CD PLAYER)...MOUNTED PCB, MAIN
922	*A-3215-842-A	PC BOARD ASSY, MAIN
923	*A-3273-074-A	MOUNTED PCB, CONTROL
924	*A-3273-074-A	MOUNTED PCB, CONTROL
925	8-848-006-01	DEVICE, OPTICAL (KSS-110A)
926	X-2622-801-1	(M901 OF CD)...PC BOARD ASSY, STATOR
927	1-131-367-00	(CD STATOR BOARD)... TANTALUM 22MF 20% 20V
928	1-163-141-00	(CD STATOR BOARD)... CERAMIC CHIP 0.001MF 10% 50V
929	1-163-038-00	(CD STATOR BOARD)... CERAMIC CHIP 0.1MF 25V
930	1-216-032-00	(CD STATOR BOARD)... METAL CHIP 200 5% 1/10W
931	1-216-050-00	(CD STATOR BOARD)... METAL CHIP 1.1K 5% 1/10W
932	1-216-057-00	(CD STATOR BOARD)... METAL CHIP 2.2K 5% 1/10W
933	1-216-063-00	(CD STATOR BOARD)... METAL CHIP 3.9K 5% 1/10W
934	1-216-090-00	(CD STATOR BOARD)... METAL CHIP 51K 5% 1/10W
935	1-216-298-00	(CD STATOR BOARD)... METAL CHIP 2.2 5% 1/10W
936	1-216-324-11	(CD STATOR BOARD)... METAL CHIP 10K 1% 1/10W
937	1-216-325-11	(CD STATOR BOARD)... METAL CHIP 100K 1% 1/10W
938	1-421-673-11	(CD STATOR BOARD)...COIL, CHOKE 70UH
939	8-719-101-23	(CD STATOR BOARD)...DIODE 1SS123
940	*1-616-738-00	PC BOARD, FUSE

ELECTRICAL PARTS

Ref.No.	Part No.	Description
ANT	1-501-309-11	ANTENNA, TELESCOPIC
C1	1-102-953-00	(E,AEP,US,Canadian,UK).... CERAMIC 18PF 5% 50V
C1	1-102-961-00	(G-AEP)...CERAMIC 24PF 10% 50V
C1	1-123-646-00	(CD)......ELECT 33MF 20% 6.3V
C2	1-101-004-00	CERAMIC 0.01MF 50V
C2	1-163-109-00	(CD)...CERAMIC CHIP 47PF 5% 50V
C3	1-162-195-31	CERAMIC 4.7PF 10% 50V
C3	1-163-109-00	(CD)...CERAMIC CHIP 47PF 5% 50V
C4	1-162-283-31	CERAMIC 120PF 10% 50V
C4	1-163-088-00	(CD)...CERAMIC CHIP 5PF 0.25PF 50V
C5	1-101-004-00	CERAMIC 0.01MF 50V
C5	1-163-021-00	(CD)...CERAMIC CHIP 0.01MF 10% 50V
C6	1-101-004-00	CERAMIC 0.01MF 50V
C7	1-101-004-00	CERAMIC 0.01MF 50V
C7	1-123-646-00	(CD)...ELECT 33MF 20% 6.3V
C8	1-101-004-00	CERAMIC 0.01MF 50V
C8	1-163-114-00	(CD)...CERAMIC CHIP 75PF 5% 50V
C9	1-162-197-31	CERAMIC 6.8PF 10% 50V
C9	1-163-114-00	(CD)...CERAMIC CHIP 75PF 5% 50V
C10	1-102-514-00	CERAMIC 22PF 10% 50V
C10	1-102-517-00	(G-AEP)........CERAMIC 30PF 5% 50V
C10	1-163-074-00	(CD)...CERAMIC CHIP 0.033MF 10% 25V
C11	1-102-808-00	(US,Canadian)...CERAMIC 6PF 5% 50V
C11	1-135-091-00	(CD)...TANTAL CHIP 1MF 10% 16V
C11	1-162-197-31	(E,AEP,UK)...CERAMIC 6.8PF 10% 50V
C12	1-123-646-00	(CD)...ELECT 33MF 20% 6.3V
C12	1-162-187-31	(E)....CERAMIC 1PF 20% 50V
C13	1-123-379-00	ELECT 0.47MF 20% 50V
C13	1-163-021-00	(CD)...CERAMIC CHIP 0.01MF 10% 50V
C14	1-123-382-00	ELECT 3.3MF 20% 50V
C14	1-123-661-00	(CD)...ELECT 100MF 20% 6.3V
C15	1-123-382-00	ELECT 3.3MF 20% 50V
C15	1-163-038-00	(CD)...CERAMIC CHIP 0.1MF 25V
C16	1-102-864-00	CERAMIC 5PF 0.5PF 50V
C16	1-163-038-00	(CD)...CERAMIC CHIP 0.1MF 25V
C17	1-101-005-00	CERAMIC 0.022MF 50V
C17	1-135-091-00	(CD)...TANTAL. CHIP 1MF 10% 16V
C18	1-101-004-00	CERAMIC 0.01MF 50V
C19	1-101-004-00	CERAMIC 0.01MF 50V
C20	1-124-443-00	(CD)...ELECT 100MF 20% 10V
C21	1-123-356-00	ELECT 10MF 20% 16V
C22	1-101-880-00	CERAMIC 47PF 5% 50V
C23	1-101-005-00	CERAMIC 0.022MF 50V
C24	1-162-282-31	CERAMIC 100PF 10% 50V
C25	1-162-282-31	CERAMIC 100PF 10% 50V
C26	1-162-195-31	CERAMIC 4.7PF 10% 50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C27	1-101-005-00	CERAMIC	0.022MF		50V
C28	1-161-054-00	CERAMIC	0.018MF	10%	25V
C29	1-101-005-00	CERAMIC	0.022MF		50V
C30	1-123-380-00	ELECT	1MF	20%	50V
C31	1-123-382-00	ELECT	3.3MF	20%	50V
C32	1-161-938-00	CERAMIC	0.001MF	5%	50V
C33	1-123-382-00	ELECT	3.3MF	20%	50V
C34	1-123-379-00	ELECT	0.47MF	20%	50V
C35	1-123-379-00	ELECT	0.47MF	20%	50V
C36	1-161-021-00	CERAMIC	0.047MF	10%	25V
C37	1-161-021-00	CERAMIC	0.047MF	10%	25V
C38	1-124-443-00	ELECT	100MF	20%	10V
C39	1-123-356-00	ELECT	10MF	20%	16V
C40	1-101-005-00	CERAMIC	0.022MF		50V
C41	1-101-004-00	CERAMIC	0.01MF		50V
C42	1-123-356-00	ELECT	10MF	20%	16V
C43	1-101-004-00	CERAMIC	0.01MF		50V
C44	1-162-282-00	(US,Canadian)...CERAMIC	100PF		50V
C45	1-123-382-00	ELECT	3.3MF	20%	50V
C46	1-102-965-00	CERAMIC	39PF	10%	50V
C101	1-123-369-00	ELECT	4.7MF	20%	25V
C101	1-163-212-00	(CD)...CERAMIC CHIP	0.002MF	5%	50V
C102	1-102-117-00	CERAMIC	820PF	10%	50V
C102	1-123-646-00	(CD)...ELECT	33MF	20%	6.3V
C103	1-162-294-31	CERAMIC	0.001MF	10%	50V
C103	1-163-188-00	(CD)...CERAMIC CHIP	200PF	5%	50V
C104	1-124-443-00	ELECT	100MF	20%	10V
C104	1-163-335-11	(CD)...CERAMIC CHIP	0.001MF	5%	50V
C105	1-130-487-00	MYLAR	0.022MF	5%	50V
C105	1-163-335-11	(CD)...CERAMIC CHIP	0.001MF	5%	50V
C106	1-130-485-00	MYLAR	0.015MF	5%	50V
C106	1-163-335-11	(CD)...CERAMIC CHIP	0.001MF	5%	50V
C107	1-123-382-00	ELECT	3.3MF	20%	50V
C107	1-163-108-00	(CD)...CERAMIC CHIP	43PF	5%	50V
C108	1-102-110-00	CERAMIC	220PF	10%	50V
C108	1-163-211-00	(CD)...CERAMIC CHIP	0.0018MF	5%	50V
C109	1-101-367-00	CERAMIC	160PF	5%	50V
C110	1-123-382-00	ELECT	3.3MF	20%	50V
C110	1-163-335-11	(CD)...CERAMIC CHIP	0.001MF	5%	50V
C111	1-130-473-00	MYLAR	0.0015MF	5%	50V
C111	1-163-108-00	(CD)...CERAMIC CHIP	43PF	5%	50V
C112	1-123-369-00	ELECT	4.7MF	20%	25V
C112	1-163-056-00	(CD)...CERAMIC CHIP	0.0056MF	10%	50V
C113	1-130-477-00	(CD)...MYLAR	0.0033MF	5%	50V
C113	1-130-479-00	MYLAR	0.0047MF	5%	50V
C114	1-123-380-00	ELECT	1MF	20%	50V
C114	1-131-375-00	(CD)...TANTALUM	4.7MF	20%	10V
C115	1-130-486-00	MYLAR	0.018MF	5%	50V
C115	1-131-375-00	(CD)...TANTALUM	4.7MF	20%	10V
C116	1-127-475-00	ELECT(SOLID)	0.22MF	5%	25V
C116	1-163-055-00	(CD)...CERAMIC CHIP	0.0047MF	10%	50V
C117	1-131-407-00	ELECT(SOLID)	0.68MF	5%	25V
C118	1-130-489-00	MYLAR	0.033MF	5%	50V
C119	1-123-382-00	ELECT	3.3MF	20%	50V
C120	1-123-382-00	ELECT	3.3MF	20%	50V
C121	1-123-382-00	ELECT	3.3MF	20%	50V
C122	1-123-382-00	ELECT	3.3MF	20%	50V
C123	1-123-382-00	ELECT	3.3MF	20%	50V
C125	1-130-481-00	MYLAR	0.0068MF	5%	50V
C126	1-130-475-00	MYLAR	0.0022MF	5%	50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C127	1-123-382-00	ELECT	3.3MF	20%	50V
C128	1-130-484-00	MYLAR	0.012MF	5%	50V
C129	1-123-382-00	ELECT	3.3MF	20%	50V
C130	1-123-382-00	ELECT	3.3MF	20%	50V
C141	1-123-332-00	ELECT	47MF	20%	16V
C146	1-130-497-00	MYLAR	0.15MF	5%	50V
C148	1-124-445-00	ELECT	100MF	20%	16V
C150	1-124-555-00	ELECT	1000MF	20%	16V
C152	1-102-947-00	CERAMIC	10PF	5%	50V
C154	1-162-282-31	CERAMIC	100PF	10%	50V
C155	1-161-045-00	CERAMIC	0.0033MF	10%	50V
C161	1-123-382-00	ELECT	3.3MF	20%	50V
C162	1-102-113-00	(CD)...CERAMIC	390PF	10%	50V
C163	1-161-049-00	(CD)...CERAMIC	0.0068MF	10%	25V
C164	1-123-330-00	(CD)...ELECT	22MF	20%	16V
C165	1-161-040-00	CERAMIC	0.0012MF	10%	25V
C166	1-161-055-00	CERAMIC	0.022MF	10%	25V
C167	1-123-382-00	ELECT	3.3MF	20%	50V
C168	1-102-074-00	CERAMIC	0.001MF	10%	50V
C169	1-161-046-00	CERAMIC	0.0039MF	10%	25V
C170	1-161-023-00	CERAMIC	0.068MF	10%	25V
C171	1-161-052-00	CERAMIC	0.012MF	10%	25V
C172	1-136-169-00	FILM	0.22MF	5%	50V
C173	1-131-407-00	ELECT(SOLID)	0.68MF	5%	25V
C174	1-161-058-00	CERAMIC	0.039MF	10%	25V
C176	1-162-294-31	CERAMIC	0.001MF	10%	50V
C177	1-123-553-00	ELECT(NONPOLARIZED)	15MF	20%	50V
C178	1-130-495-00	MYLAR	0.1	5%	50V
C179	1-162-282-31	CERAMIC	100PF	10%	50V
C180	1-162-282-31	CERAMIC	100PF	10%	50V
C181	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C182	1-102-106-00	(US,Canadian)...CERAMIC	100PF	5%	50V
C190	1-123-546-00	ELECT(NONPOLARIZED)	3.3MF	20%	50V
C301	1-123-379-00	ELECT	0.47MF	20%	50V
C301	1-163-109-00	(CD)...CERAMIC CHIP	47PF	5%	50V
C302	1-162-294-31	CERAMIC	0.001MF	10%	50V
C302	1-163-099-00	(CD)...CERAMIC CHIP	18PF	5%	50V
C303	1-124-169-00	ELECT	100MF	20%	10V
C303	1-163-109-00	(CD)...CERAMIC CHIP	47PF	5%	50V
C304	1-123-330-00	ELECT	22MF	20%	16V
C304	1-163-141-00	(CD)...CERAMIC CHIP	0.001MF	10%	50V
C305	1-123-647-00	(CD)...ELECT	47MF	20%	6.3V
C305	1-124-444-00	ELECT	220MF	20%	10V
C306	1-123-820-00	(CD)...ELECT	33MF	20%	16V
C307	1-124-444-00	ELECT	220MF	20%	10V
C307	1-131-375-00	(CD)...TANTALUM	4.7MF	20%	10V
C308	1-124-444-00	ELECT	220MF	20%	10V
C308	1-131-375-00	(CD)...TANTALUM	4.7MF	20%	10V
C309	1-123-356-00	ELECT	10MF	20%	16V
C310	1-123-369-00	ELECT	4.7MF	20%	25V
C310	1-123-647-00	(CD)...ELECT	47MF	20%	6.3V
C311	1-123-318-00	ELECT	33MF	20%	16V
C312	1-123-379-00	ELECT	0.47MF	20%	50V
C312	1-123-647-00	(CD)...ELECT	47MF	20%	6.3V
C313	1-123-380-00	ELECT	1MF	20%	50V
C313	1-123-646-00	(CD)...ELECT	33MF	20%	6.3V
C314	1-106-182-00	MYLAR	0.0027MF	5%	100V
C314	1-123-646-00	(CD)...ELECT	33MF	20%	6.3V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C315	1-106-174-00	MYLAR	0.0012MF	5%	100V
C315	1-123-298-00	(CD)...ELECT	470MF	20%	6.3V
C316	1-123-298-00	(CD)...ELECT	470MF	20%	6.3V
C316	1-124-443-00	ELECT	100MF	20%	10V
C317	1-123-306-00	ELECT	47MF	20%	10V
C317	1-123-320-00	(CD)...ELECT	100MF	20%	16V
C318	1-124-443-00	ELECT	100MF	20%	10V
C319	1-123-379-00	ELECT	0.47MF	20%	50V
C319	1-123-661-00	(CD)...ELECT	100MF	20%	6.3V
C320	1-123-382-00	ELECT	3.3MF	20%	50V
C320	1-123-661-00	(CD)...ELECT	100MF	20%	6.3V
C321	1-123-379-00	ELECT	0.47MF	20%	50V
C321	1-135-092-21	(CD)...TANTAL. CHIP	3.3MF	20%	16V
C322	1-102-973-00	(CD)...CERAMIC	100PF	5%	50V
C322	1-130-495-00	MYLAR	0.1MF	5%	50V
C323	1-123-381-00	ELECT	2.2MF	20%	50V
C324	1-123-343-00	ELECT	33MF	20%	25V
C325	1-162-306-31	CERAMIC	0.01MF	30%	16V
C326	1-123-382-00	ELECT	3.3MF	20%	50V
C330	1-162-294-31	CERAMIC	0.001MF	10%	50V
C331	1-123-306-00	ELECT	47MF	20%	10V
C332	1-162-294-31	CERAMIC	0.001MF	10%	50V
C334	1-124-120-11	ELECT	220MF	20%	25V
C335	1-124-477-11	ELECT	47MF	20%	25V
C337	1-123-321-00	ELECT	220MF	20%	16V
C338	1-162-282-31	CERAMIC	100PF	10%	50V
C339	1-124-444-00	ELECT	220MF	20%	10V
C340	1-101-004-00	CERAMIC	0.01MF		50V
C341	1-124-444-00	ELECT	220MF	20%	10V
C343	1-123-379-00	ELECT	0.47MF	20%	50V
C344	1-124-445-00	ELECT	100MF	20%	16V
C501	1-123-646-00	(CD)...ELECT	33MF	20%	6.3V
C502	1-131-379-00	(CD)...TANTALUM	22MF	20%	10V
C503	1-163-038-00	(CD)...CERAMIC CHIP	0.1MF		25V
C504	1-163-081-00	(CD)...CERAMIC CHIP	0.22MF		25V
C505	1-163-033-00	(CD)...CERAMIC CHIP	0.022MF	10%	25V
C506	1-163-075-00	(CD)...CERAMIC CHIP	0.047MF	10%	25V
C507	1-163-021-00	(CD)...CERAMIC CHIP	0.01MF	10%	50V
C508	1-163-114-00	(CD)...CERAMIC CHIP	75PF	5%	50V
C509	1-163-109-00	(CD)...CERAMIC CHIP	47PF	5%	50V
C510	1-163-081-00	(CD)...CERAMIC CHIP	0.22MF		25V
C511	1-135-103-00	(CD)...TANTAL. CHIP	3.3MF	10%	4V
C512	1-163-124-00	(CD)...CERAMIC CHIP	200PF	5%	50V
C513	1-163-019-00	(CD)...CERAMIC CHIP	0.0068MF	10%	50V
C514	1-163-021-00	(CD)...CERAMIC CHIP	0.01MF	10%	50V
C515	1-163-019-00	(CD)...CERAMIC CHIP	0.0068MF	10%	50V
C516	1-163-013-00	(CD)...CERAMIC CHIP	0.0022MF	10%	50V
C518	1-163-021-00	(CD)...CERAMIC CHIP	0.01MF	10%	50V
C519	1-163-143-00	(CD)...CERAMIC CHIP	0.0012MF	10%	50V
C520	1-163-038-00	(CD)...CERAMIC CHIP	0.1MF		25V
C521	1-163-038-00	(CD)...CERAMIC CHIP	0.1MF		25V
C522	1-163-038-00	(CD)...CERAMIC CHIP	0.1MF		25V
C523	1-135-088-21	(CD)...TANTAL. CHIP	2.2MF	20%	20V
C524	1-135-088-21	(CD)...TANTAL. CHIP	2.2MF	20%	20V
C525	1-163-038-00	(CD)...CERAMIC CHIP	0.1MF		25V
C526	1-163-038-00	(CD)...CERAMIC CHIP	0.1MF		25V
C527	1-135-088-21	(CD)...TANTAL. CHIP	2.2MF	20%	20V
C528	1-163-038-00	(CD)...CERAMIC CHIP	0.1MF		25V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C529	1-163-033-00	(CD)...CERAMIC CHIP	0.022MF	10%	25V
C530	1-163-033-00	(CD)...CERAMIC CHIP	0.022MF	10%	25V
C531	1-135-091-00	(CD)...TANTAL. CHIP	1MF	10%	16V
C532	1-163-033-00	(CD)...CERAMIC CHIP	0.022MF	10%	25V
C533	1-163-021-00	(CD)...CERAMIC CHIP	0.01MF	10%	50V
C534	1-163-021-00	(CD)...CERAMIC CHIP	0.01MF	10%	50V
C535	1-163-021-00	(CD)...CERAMIC CHIP	0.01MF	10%	50V
C536	1-131-408-00	(CD)...TANTALUM	1MF	10%	25V
C538	1-135-083-00	(CD)...TANTAL. CHIP	0.47MF	10%	25V
C601	1-161-183-00	CERAMIC	0.0068MF	5%	25V
C601	1-163-038-00	(CD)...CERAMIC CHIP	0.1MF		25V
C602	1-130-480-00	MYLAR	0.0056MF	5%	50V
C602	1-163-101-00	(CD)...CERAMIC CHIP	22PF	5%	50V
C603	1-123-356-00	ELECT	10MF	20%	16V
C603	1-163-101-00	(CD)...CERAMIC CHIP	22PF	5%	50V
C604	1-123-318-00	ELECT	33MF	20%	16V
C604	1-163-038-00	(CD)...CERAMIC CHIP	0.1MF		25V
C605	1-124-444-00	ELECT	220MF	20%	10V
C605	1-135-091-00	(CD)...TANTAL CHIP	1MF	10%	16V
C606	1-124-444-00	ELECT	220MF	20%	10V
C606	1-163-113-00	(CD)...CERAMIC CHIP	68PF	5%	50V
C607	1-123-617-00	(CD)...ELECT	10MF	20%	16V
C607	1-124-444-00	ELECT	220MF	20%	10V
C608	1-123-306-00	ELECT	47MF	20%	10V
C608	1-163-063-00	(CD)...CERAMIC CHIP	0.022MF	10%	50V
C609	1-163-594-00	(CD)...CERAMIC CHIP	33PF	5%	50V
C610	1-163-105-00	(CD)...CERAMIC CHIP	33PF	5%	50V
C611	1-163-123-00	(CD)...CERAMIC CHIP	180PF	5%	50V
C612	1-162-306-31	CERAMIC	0.01MF	30%	16V
C612	1-163-833-00	(CD)...CERAMIC CHIP	0.068MF		25V
C613	1-123-321-00	ELECT	220MF	20%	6.3V
C614	1-123-382-00	ELECT	3.3MF	20%	50V
C614	1-163-022-00	(CD)...CERAMIC CHIP	0.012MF	10%	50V
C615	1-123-617-00	ELECT	10MF	20%	16V
C615	1-163-021-00	(CD)...CERAMIC CHIP	0.01MF	10%	50V
C616	1-123-380-00	ELECT	1MF	20%	50V
C616	1-163-038-00	(CD)...CERAMIC CHIP	0.1MF		25V
C617	1-123-381-00	ELECT	2.2MF	20%	50V
C617	1-123-646-00	(CD)...ELECT	33MF	20%	6.3V
C618	1-123-356-00	ELECT	10MF	20%	16V
C618	1-123-646-00	(CD)...ELECT	33MF	20%	6.3V
C619	1-163-594-00	(US:CD)....CERAMIC CHIP	33PF	5%	50V
C620	1-163-594-00	(US:CD)....CERAMIC CHIP	33PF	5%	50V
C701	1-101-004-00	CERAMIC	0.01MF		50V
C702	1-101-004-00	CERAMIC	0.01MF		50V
C703	1-101-004-00	CERAMIC	0.01MF		50V
C704	⚠ 1-124-564-11	ELECT	4700MF	20%	25V
C801	1-124-555-00	ELECT	1000MF	20%	16V
C801	1-163-119-00	(CD)...CERAMIC CHIP	120PF	5%	50V
C802	1-124-555-00	ELECT	1000MF	20%	16V
C802	1-131-385-00	(CD)...TANTALUM	22MF	20%	6.3V
C803	1-123-330-00	ELECT	22MF	20%	16V
C803	1-131-361-00	(CD)...TANTALUM	2.2MF	20%	20V
C804	1-124-555-00	ELECT	1000MF	20%	16V
C901	1-123-306-00	ELECT	47MF	20%	10V
C901	1-163-017-00	(CD)...CERAMIC CHIP	0.0047MF	10%	50V
CF1	1-527-786-00	FILTER, CERAMIC			
CF2	1-527-786-00	FILTER, CERAMIC			
CF3	1-527-865-00	FILTER, CERAMIC			

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ELECTRICAL PARTS

Ref.No.	Part No.	Description
CNJ301	*1-561-414-11	SOCKET, CONNECTOR 9P
CNJ302	*1-562-827-11	SOCKET, CONNECTOR 15P
CNJ701	⚠1-526-818-11	(US,Canadian)...INLET, AC
CNJ701	⚠1-526-822-11	(E,AEP).........INLET, AC
CNJ701	⚠1-526-838-11	(UK)...........INLET, AC
CNJ902	*1-561-581-00	HOUSING, CONNECTOR 2P
CNJ904	*1-561-147-00	CONNECTOR, HOUSING 3P
CNJ906	*1-561-584-00	HOUSING, CONNECTOR 3P
CNJ907	*1-561-148-00	HOUSING, CONNECTOR 4P
CNJ908	*1-561-148-00	HOUSING, CONNECTOR 4P
CNJ909	*1-561-147-00	HOUSING, CONNECTOR 3P
CNP301	*1-564-585-11	CONNECTOR, PIN (U TYPE) 9P
CNP302	*1-564-933-11	CONNECTOR, PIN (U TYPE) 15P
CNP901	*1-560-468-00	PIN, CONNECTOR 5P
CNP902	*1-560-455-00	PIN, CONNECTOR 2P
CNP903	*1-560-469-00	PIN, CONNECTOR 6P
CNP904	*1-508-734-00	CONNECTOR PIN
CNP905	*1-508-797-00	PIN, CONNECTOR 4P
CNP906	*1-560-459-00	PIN, CONNECTOR 3P
CNP907	*1-508-847-00	PIN, CONNECTOR 4P
CNP908	*1-560-462-00	PIN, CONNECTOR 6P
CNP909	*1-508-734-00	PIN, CONNECTOR 3P
CNP910	*1-560-470-00	PIN, CONNECTOR 8P
CP301	1-464-261-00	OSCILLATOR UNIT, BIAS (MAIN UNIT)
CP301	1-464-378-12	(E,US,Canadian,AEP:CD)... CONVERTER UNIT, DC-DC
CP301	1-464-378-13	(UK)...CONVERTER UNIT, DC-DC
CT1-4 CV1-4	1-151-466-11	CAP, TUNING, POLYETHYLENE
D1	8-719-911-19	DIODE 1SS119
D1	8-719-921-11	(CD)....DIODE HZ2ALL
D2	8-719-911-19	DIODE 1SS119
D3	8-719-111-13	DIODE SP113
D4	8-719-918-97	DIODE SLP153B-40
D5	8-719-918-98	DIODE SLP253B-40
D301	8-719-911-19	DIODE 1SS119
D302	8-719-911-19	DIODE 1SS119
D303	8-719-911-06	DIODE 1SS106
D304	8-719-911-19	DIODE 1SS119
D305	8-719-911-19	DIODE 1SS119
D306	8-719-911-19	DIODE 1SS119
D308	8-719-918-97	DIODE SLP153B-40
D309	8-719-150-49	DIODE (US,Canadian)...RD12EB2T
D309	8-719-150-56	DIODE (E,AEP,UK).....RD12EB2T
D310	8-719-100-14	DIODE RD3.0E-B1
D401	8-719-902-35	DIODE SLP235B
D403	8-719-912-45	DIODE SLP435B
D404	8-719-901-35	DIODE SLP135B
D405	8-719-911-19	DIODE 1SS119
D501	8-719-105-82	DIODE RD5.1M-B2
D502	8-719-100-03	DIODE 1S2835
D503	8-719-100-03	DIODE 1S2835
D504	8-719-100-03	DIODE 1S2835
D505	8-719-100-03	DIODE 1S2835
D506	8-719-100-03	DIODE 1S2835
D507	8-719-100-03	DIODE 1S2835

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D508	8-719-100-03	DIODE 1S2835
D509	8-719-100-03	DIODE 1S2835
D510	8-719-100-03	DIODE 1S2835
D511	8-719-101-23	DIODE 1SS123
D512	8-719-101-23	DIODE 1SS123
D513	8-719-911-06	DIODE 1SS106
D515	8-719-101-23	DIODE 1SS123
D516	8-719-101-23	DIODE 1SS123
D601	8-719-101-23	(CD)...DIODE 1SS123
D601	8-719-911-19	DIODE 1SS119
D602	8-719-911-19	DIODE 1SS119
D602	8-719-923-64	(CD)...DIODE KV1230
D603	8-719-911-19	DIODE 1SS119
D604	8-719-911-19	DIODE 1SS119
D605	8-719-100-48	DIODE RD8.2E-B2
D606	8-719-911-19	DIODE 1SS119
D607	8-719-911-19	DIODE 1SS119
D608	8-719-911-19	DIODE 1SS119G
D609	8-719-100-29	DIODE RD5.1E-B1
D610	8-719-911-19	DIODE 1SS119
D611	8-719-911-19	DIODE 1SS119
D612	8-719-911-19	DIODE 1SS119
D613	8-719-911-19	DIODE 1SS119
D614	8-719-911-19	DIODE 1SS119
D615	8-719-911-19	DIODE 1SS119
D616	8-719-911-19	DIODE 1SS119
D617	8-719-911-19	DIODE 1SS119
D618	8-719-911-19	DIODE 1SS119
D619	8-719-200-02	DIODE 10E-2
D701	8-719-503-06	DIODE S3WB60Z
D801	8-719-100-03	(CD)...DIODE 1S2835
D801	8-719-901-66	DIODE LT-9200N
D802	8-719-100-03	(CD)...DIODE 1S2835
D802	8-719-911-19	DIODE 1SS119
D803	8-719-911-19	DIODE 1SS119
D803	8-719-101-51	(CD)...DIODE RD5.1E-L3
D804	8-719-911-19	DIODE 1SS119
D901	8-719-800-08	DIODE TLR213
F301	⚠1-532-215-00	(E).............FUSE, TIME-LAG, 0.8A
F301	⚠1-532-284-00	(AEP,UK)........FUSE, TIME-LAG, 0.630A
F301	⚠1-532-555-00	(US,Canadian)...FUSE, GLASS TUBE 1.6A
F302	⚠1-532-325-00	(E,AEP,UK)......FUSE, TIME-LAG, 6.3A
F302	⚠1-532-656-00	(US,Canadian)...FUSE, GLASS TUBE 6.3A
F303	1-532-779-00	(E)...FUSE, MICRO (SECONDARY DC)
F801	⚠1-532-078-00	(E,AEP,UK)......FUSE, TIME-LAG, 1.0A
F801	⚠1-532-555-00	(US,Canadian)...FUSE, GLASS TUBE 1.6A
F901	⚠1-532-684-00	(US,Canadian)...FUSE, GLASS TUBE 0.8A
F901	⚠1-532-215-00	(E,AEP,UK)......FUSE, TIME-LAG, T 0.8A
FL1	1-231-892-00	FILTER, BANDPASS
FL2	1-235-221-00	FILTER, LOW PASS
FL101	1-235-403-11	FILTER, LOW PASS
FL201	1-235-403-11	FILTER, LOW PASS
HE101	8-825-516-22	HEAD, REC/PB ERASE(EPP266-3602)
HRP101	8-825-516-22	HEAD, REC/PB ERASE(EPP266-3602)

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ELECTRICAL PARTS

Ref.No.	Part No.	Description
IC1	8-752-010-90	IC CX20109
IC2	8-759-700-43	IC NJM4558M
IC51	8-759-801-24	IC LA1260S
IC52	8-759-200-62	IC TA7343P
IC101	8-759-908-16	IC TL072CPS
IC102	8-759-745-64	IC NJM4560M
IC151	8-759-801-23	IC LA3600
IC201	8-759-908-16	IC TL072CPS
IC202	8-759-745-64	IC NJM4560M
IC251	8-759-801-23	IC LA3600
IC301	8-752-013-30	IC CX20133
IC302	8-759-103-25	IC UPD4053BG
IC303	8-759-103-25	IC UPD4053BG
IC304	8-759-745-64	IC NJM4560M
IC305	8-759-700-40	IC NJM4560S
IC351	8-759-800-66	IC LA3161
IC352	8-759-300-32	IC HA12047
IC353	8-759-800-71	IC LA2010
IC354	8-759-841-26	IC LA4126T
IC501	8-752-010-80	IC CX20108
IC502	8-759-700-43	IC NJM4558M
IC503	8-759-103-09	IC UPC4082G2
IC504	8-759-700-75	IC NJM2901MB
IC505	8-759-700-75	IC NJM2901MB
IC506	8-759-908-81	IC MB3763PF
IC507	8-759-908-81	IC MB3763PF
IC508	8-759-908-81	IC MB3763PF
IC509	8-759-200-79	IC TC4049BF
IC601	8-759-912-52	IC CX23035
IC602	8-759-302-69	IC HM6116FP-3
IC603	8-759-103-09	IC UPC4082G2
IC604	8-759-700-43	IC NJM4558M
IC651	8-759-202-58	IC TC9310N-049
IC801	8-759-920-27	IC MB88541-130M
IC802	8-759-912-55	IC S-81250HG
J301	1-562-838-11	JACK, PIN 4P (LINE IN/LINE OUT)
J302	1-507-678-00	JACK (MIC MIXING)
J304	1-562-837-11	JACK (PHONES)
J305	1-507-954-11	JACK, EXTERNAL POWER (DC IN 12V)
JR301	1-216-295-00	METAL CHIP 0 5% 1/10W
JR302	1-216-295-00	METAL CHIP 0 5% 1/10W
JR503	1-216-295-00	METAL CHIP 0 5% 1/10W
JR801	1-216-296-00	METAL CHIP 0 5% 1/8W
L1	1-459-397-00	COIL (WITH CORE)
L2	1-410-012-21	MICRO INDUCTOR 1.8UH
L3	1-459-393-00	COIL (WITH CORE)
L4	1-402-105-11	ANTENNA, FERRITE-ROD (MW)
L101	1-408-928-00	MICRO INDUCTOR 22MMH
L102	1-408-922-00	MICRO INDUCTOR 6.8MMH
L201	1-408-928-00	MICRO INDUCTOR 22MMH
L202	1-408-922-00	MICRO INDUCTOR 6.8MMH
L301	1-408-080-00	MICRO INDUCTOR 100UH
L301	1-408-728-21	(CD)...INDUCTOR CHIP 1UH
L601	1-408-579-00	MICRO INDUCTOR 220UH
L602	1-410-009-11	MICRO INDUCTOR 1UH
L603	1-405-982-00	COIL, OSC (SW^1)

ELECTRICAL PARTS

Ref.No.	Part No.	Description
M901	X-2622-801-1	PC BOARD ASSY, STATOR
M902	X-3320-102-1	MOTOR ASSY, FEED
ND901	1-807-179-11	(E,AEP,UK)......LIQUID CRYSTAL MODULE
ND901	1-807-179-21	(US,Canadian)...LIQUID CRYSTAL MODULE
PH751	8-719-913-55	DIODE GP-2S04-B
PM901	1-454-351-00	SOLENOID, PLUNGER
PM902	1-454-351-00	SOLENOID, PLUNGER
PM903	1-454-352-00	SOLENOID, PLUNGER
PS301⚠	1-532-685-00	LINK, IC
PS302⚠	1-532-605-00	(UK:CD)...LINK, IC
Q1	8-729-101-07	(CD)...TRANSISTOR 2SB798
Q1	8-729-119-32	TRANSISTOR 2SK193
Q2	8-729-883-92	TRANSISTOR 2SC2839
Q3	8-729-162-44	(CD)...TRANSISTOR 2SB624
Q3	8-729-672-42	TRANSISTOR 2SC2724-C
Q4	8-729-802-12	TRANSISTOR 2SC2840-DL
Q5	8-729-606-33	TRANSISTOR 2SC2603F
Q101	8-729-105-53	(CD)...TRANSISTOR 2SK300
Q101	8-729-606-33	TRANSISTOR 2SC2603F
Q102	8-729-100-13	TRANSISTOR 2SC2001
Q103	8-729-606-33	TRANSISTOR 2SC2603F
Q104	8-729-606-33	TRANSISTOR 2SC2603F
Q105	8-729-100-13	TRANSISTOR 2SC2001
Q201	8-729-105-53	(CD)...TRANSISTOR 2SK300
Q201	8-729-606-33	TRANSISTOR 2SC2603F
Q202	8-729-100-13	TRANSISTOR 2SC2001
Q203	8-729-606-33	TRANSISTOR 2SC2603F
Q204	8-729-606-33	TRANSISTOR 2SC2603F
Q205	8-729-100-13	TRANSISTOR 2SC2001
Q301	8-729-101-07	(CD)...TRANSISTOR 2SB798
Q301	8-729-606-33	TRANSISTOR 2SC2603F
Q302	8-729-606-33	TRANSISTOR 2SC2603F
Q303	8-729-801-45	TRANSISTOR 2SC3064-E
Q304	8-729-162-44	(CD)...TRANSISTOR 2SB624
Q304	8-729-606-33	TRANSISTOR 2SC2603F
Q305	8-729-162-44	(CD)...TRANSISTOR 2SB624
Q305	8-729-606-33	TRANSISTOR 2SC2603F
Q306	8-729-199-92	(CD)...TRANSISTOR 2SD999
Q306	8-729-800-83	TRANSISTOR 2SB808
Q307	8-729-606-33	TRANSISTOR 2SC2603F
Q308	8-729-901-00	(CD)...TRANSISTOR DTC124EK
Q309	8-729-401-63	TRANSISTOR 2SD1273-P
Q310	8-729-224-63	TRANSISTOR 2SK246-BL
Q401	8-729-606-33	TRANSISTOR 2SC2603F
Q402	8-729-606-33	TRANSISTOR 2SC2603F
Q601	8-729-606-33	TRANSISTOR 2SC2603F
Q602	8-729-606-33	TRANSISTOR 2SC2603F
Q603	8-729-162-44	(CD)...TRANSISTOR 2SB624
Q603	8-729-606-33	TRANSISTOR 2SC2603F
Q604	8-729-606-33	TRANSISTOR 2SC2603F
Q605	8-729-606-33	TRANSISTOR 2SC2603F
Q606	8-729-606-33	TRANSISTOR 2SC2603F

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ELECTRICAL PARTS

Ref.No.	Part No.	Description				
Q607	8-729-401-63	TRANSISTOR 2SD1273-P				
Q608	8-729-378-84	TRANSISTOR 2SD788				
Q609	8-729-224-63	TRANSISTOR 2SK246-BL				
Q610	8-729-606-33	TRANSISTOR 2SC2603F				
Q611	8-729-204-83	TRANSISTOR 2SA1048				
Q612	8-729-606-33	TRANSISTOR 2SC2603F				
Q613	8-729-606-33	TRANSISTOR 2SC2603F				
Q614	8-729-606-33	TRANSISTOR 2SC2603F				
Q801	8-729-401-63	TRANSISTOR 2SD1273-P				
Q802	8-729-606-33	TRANSISTOR 2SC2603F				
Q803	8-729-606-33	TRANSISTOR 2SC2603F				
Q804	8-729-204-83	TRANSISTOR 2SA1048				
Q805	8-729-606-33	TRANSISTOR 2SC2603F				
Q901	8-729-606-33	TRANSISTOR 2SC2603F				
Q902	8-729-101-13	TRANSISTOR PH103				
R1	1-247-831-00	CARBON	1K	5%	1/6W	
R2	1-216-105-00	(CD)...METAL CHIP	220K	5%	1/10W	
R2	1-247-827-00	CARBON	680	5%	1/6W	
R3	1-216-109-00	(CD)...METAL CHIP	330K	5%	1/10W	
R3	1-247-843-00	CARBON	3.3K	5%	1/6W	
R4	1-247-899-00	CARBON	680K	5%	1/6W	
R5	1-247-819-00	CARBON	330	5%	1/6W	
R6	1-247-827-00	CARBON	680	5%	1/6W	
R7	1-216-081-00	(CD)...METAL CHIP	22K	5%	1/10W	
R7	1-247-819-00	CARBON	330	5%	1/6W	
R8	1-247-823-00	CARBON	470	5%	1/6W	
R9	1-247-827-00	CARBON	680	5%	1/6W	
R10	1-247-899-00	CARBON	680K	5%	1/6W	
R11	1-247-807-00	CARBON	100	5%	1/6W	
R12	1-216-099-00	(CD)...METAL CHIP	120K	5%	1/10W	
R12	1-247-845-00	CARBON	3.9K	5%	1/6W	
R13	1-216-101-00	(CD)...METAL CHIP	150K	5%	1/10W	
R13	1-247-875-00	CARBON	68K	5%	1/6W	
R14	1-216-117-00	(CD)...METAL CHIP	680K	5%	1/10W	
R14	1-247-807-00	CARBON	100	5%	1/6W	
R15	1-247-879-00	CARBON	100K	5%	1/6W	
R16	1-247-879-00	CARBON	100K	5%	1/6W	
R17	1-249-419-11	CARBON	1.5K	5%	1/6W	
R18	1-249-429-11	CARBON	10K	5%	1/6W	
R19	1-247-831-00	CARBON	1K	5%	1/6W	
R20	1-216-091-00	(CD)...METAL CHIP	56K	5%	1/10W	
R20	1-249-429-11	CARBON	10K	5%	1/6W	
R21	1-216-129-00	(CD)...METAL CHIP	2.2M	5%	1/10W	
R21	1-247-851-00	CARBON	6.8K	5%	1/6W	
R22	1-247-849-00	CARBON	5.6K	5%	1/6W	
R23	1-216-063-00	(CD)...METAL CHIP	3.9K	5%	1/10W	
R23	1-247-829-00	CARBON	820	5%	1/6W	
R24	1-216-057-00	(CD)...METAL CHIP	2.2K	5%	1/10W	
R24	1-247-696-11	CARBON	47	5%	1/4W	F
R25	1-216-043-00	(CD)...METAL CHIP	560	5%	1/10W	
R25	1-247-831-00	CARBON	1K	5%	1/6W	
R26	1-216-164-00	(CD)...METAL CHIP	39	5%	1/8W	
R26	1-247-847-00	CARBON	4.7K	5%	1/6W	
R27	1-216-164-00	(CD)...METAL CHIP	39	5%	1/8W	
R27	1-247-831-00	CARBON	1K	5%	1/6W	
R28	1-216-097-00	(CD)...METAL CHIP	100K	5%	1/10W	
R28	1-249-429-11	CARBON	10K	5%	1/6W	
R29	1-216-057-00	(CD)...METAL CHIP	2.2K	5%	1/10W	
R29	1-247-833-00	CARBON	1.2K	5%	1/6W	

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R30	1-216-061-00	(CD)...METAL CHIP	3.3K	5%	1/10W	
R30	1-247-887-00	CARBON	220K	5%	1/6W	
R31	1-247-843-00	CARBON	3.3K	5%	1/6W	
R32	1-247-843-00	CARBON	3.3K	5%	1/6W	
R33	1-249-421-11	CARBON	2.2K	5%	1/6W	
R34	1-249-421-11	CARBON	2.2K	5%	1/6W	
R35	1-249-421-00	CARBON	2.2K	5%	1/6W	
R36	1-249-421-00	CARBON	2.2K	5%	1/6W	
R37	1-247-101-00	CARBON	56	5%	1/4W	F
R38	1-247-807-00	CARBON	100	5%	1/6W	
R101	1-216-330-11	(CD)...METAL CHIP	7.5K	1%	1/10W	
R101	1-247-806-00	CARBON	91	5%	1/6W	
R102	1-216-333-11	(CD)...METAL CHIP	15K	1%	1/10W	
R102	1-247-881-00	CARBON	120K	5%	1/6W	
R103	1-216-333-11	(CD)...METAL CHIP	15K	1%	1/10W	
R103	1-247-819-00	CARBON	330	5%	1/6W	
R104	1-216-333-11	(CD)...METAL CHIP	15K	1%	1/10W	
R104	1-247-843-00	CARBON	3.3K	5%	1/6W	
R105	1-216-329-11	(CD)...METAL CHIP	5.1K	1%	1/10W	
R105	1-247-879-00	CARBON	100K	5%	1/6W	
R106	1-216-336-11	(CD)...METAL CHIP	47K	1%	1/10W	
R106	1-247-871-00	CARBON	47K	5%	1/6W	
R107	1-216-336-11	(CD)...METAL CHIP	47K	1%	1/10W	
R107	1-247-845-00	CARBON	3.9K	5%	1/6W	
R108	1-216-334-11	(CD)...METAL CHIP	22K	1%	1/10W	
R108	1-247-861-00	CARBON	18K	5%	1/6W	
R109	1-216-329-11	(CD)...METAL CHIP	5.1K	1%	1/10W	
R109	1-249-429-11	CARBON	10K	5%	1/6W	
R110	1-216-336-11	(CD)...METAL CHIP	47K	1%	1/10W	
R110	1-247-843-00	CARBON	3.3K	5%	1/6W	
R111	1-216-336-11	(CD)...METAL CHIP	47K	1%	1/10W	
R111	1-247-871-00	CARBON	47K	5%	1/6W	
R112	1-247-850-00	CARBON	6.2K	5%	1/6W	
R113	1-216-518-00	(CD)...METAL CHIP	2.2K	1%	1/10W	
R113	1-247-879-00	CARBON	100K	5%	1/6W	
R114	1-216-518-00	(CD)...METAL CHIP	2.2K	1%	1/10W	
R114	1-249-429-11	CARBON	10K	5%	1/6W	
R115	1-216-326-11	(CD)...METAL CHIP	1.8K	1%	1/10W	
R115	1-249-421-11	CARBON	2.2K	5%	1/6W	
R116	1-216-333-11	(CD)...METAL CHIP	15K	1%	1/10W	
R116	1-247-899-00	CARBON	680K	5%	1/6W	
R117	1-216-328-11	(CD)...METAL CHIP	4.3K	1%	1/10W	
R117	1-249-421-11	CARBON	2.2K	5%	1/6W	
R118	1-216-333-11	(CD)...METAL CHIP	15K	1%	1/10W	
R118	1-247-829-00	CARBON	820	5%	1/6W	
R119	1-216-328-11	(CD)...METAL CHIP	4.3K	1%	1/10W	
R119	1-247-847-00	CARBON	4.7K	5%	1/6W	
R120	1-216-037-00	(CD)...METAL CHIP	330	5%	1/10W	
R120	1-247-863-00	CARBON	22K	5%	1/6W	
R121	1-216-059-00	(CD)...METAL CHIP	2.7K	5%	1/10W	
R121	1-247-849-00	CARBON	5.6K	5%	1/6W	
R122	1-216-033-00	(CD)...METAL CHIP	220	5%	1/10W	
R122	1-247-807-00	CARBON	100	5%	1/6W	
R123	1-247-845-00	CARBON	3.9K	5%	1/6W	
R124	1-216-017-00	(CD)...METAL CHIP	47	5%	1/10W	
R124	1-247-831-00	CARBON	1K	5%	1/6W	
R125	1-216-065-00	(CD)...METAL CHIP	4.7K	5%	1/10W	
R125	1-247-899-00	CARBON	680K	5%	1/6W	
R126	1-216-085-00	(CD)...METAL CHIP	33K	5%	1/10W	
R126	1-247-834-00	CARBON	1.3K	5%	1/6W	

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R127	1-216-168-00	(CD)...METAL CHIP	56	5%	1/8W	
R127	1-247-831-00	CARBON	1K	5%	1/6W	
R128	1-216-033-00	(CD)...METAL CHIP	220	5%	1/10W	
R129	1-216-097-00	(CD)...METAL CHIP	100K	5%	1/10W	
R130	1-216-059-00	(CD)...METAL CHIP	2.7K	5%	1/10W	
R131	1-247-807-00	CARBON	100	5%	1/6W	
R132	1-247-847-00	CARBON	4.7K	5%	1/6W	
R133	1-247-872-00	CARBON	51K	5%	1/6W	
R134	1-247-845-00	CARBON	3.9K	5%	1/6W	
R136	1-247-805-00	CARBON	82	5%	1/6W	
R138	1-247-862-00	CARBON	20K	5%	1/6W	
R139	1-247-863-00	CARBON	22K	5%	1/6W	
R140	1-249-421-11	CARBON	2.2K	5%	1/6W	
R141	1-247-851-00	CARBON	6.8K	5%	1/6W	
R142	1-247-859-00	CARBON	15K	5%	1/6W	
R143	1-247-879-00	CARBON	100K	5%	1/6W	
R144	1-249-421-11	CARBON	2.2K	5%	1/6W	
R301	1-216-025-00	(CD)...METAL CHIP	100	5%	1/10W	
R301	1-247-899-00	CARBON	680K	5%	1/6W	
R302	1-216-045-00	(CD)...METAL CHIP	680	5%	1/10W	
R302	1-247-807-00	CARBON	100	5%	1/6W	
R303	1-216-337-11	(CD)...METAL CHIP	51K	1%	1/10W	
R303	1-247-843-00	CARBON	3.3K	5%	1/6W	
R304	1-247-807-00	CARBON	100	5%	1/6W	
R305	1-216-089-00	(CD)...METAL CHIP	47K	5%	1/10W	
R306	1-216-056-00	(CD)...METAL CHIP	2K	5%	1/10W	
R307	1-216-065-00	(CD)...METAL CHIP	4.7K	5%	1/10W	
R307	1-247-807-00	CARBON	100	5%	1/6W	
R308	1-216-065-00	(CD)...METAL CHIP	4.7K	5%	1/10W	
R308	1-249-421-11	CARBON	2.2K	5%	1/6W	
R309	1-216-089-00	(CD)...METAL CHIP	47K	5%	1/10W	
R309	1-247-807-00	CARBON	100	5%	1/6W	
R310	1-216-089-00	(CD)...METAL CHIP	47K	5%	1/10W	
R310	1-247-857-00	CARBON	12K	5%	1/6W	
R311	1-216-065-00	(CD)...METAL CHIP	4.7K	5%	1/10W	
R311	1-247-891-00	CARBON	330K	5%	1/6W	
R312	1-247-831-00	CARBON	1K	5%	1/6W	
R313	1-247-817-00	CARBON	270	5%	1/6W	
R314	1-247-899-00	CARBON	680K	5%	1/6W	
R315	1-247-859-00	CARBON	15K	5%	1/6W	
R316	1-217-527-00	FUSIBLE	22	5%	1/4W	
R317	1-247-093-00	CARBON	27	5%	1/4W	F
R318	1-247-831-00	CARBON	1K	5%	1/6W	
R319	1-247-879-00	CARBON	100K	5%	1/6W	
R320	1-247-807-00	CARBON	100	5%	1/6W	
R321	1-247-831-00	CARBON	1K	5%	1/6W	
R322	1-247-899-00	CARBON	680K	5%	1/6W	
R323	1-247-851-00	CARBON	6.8K	5%	1/6W	
R325	1-249-421-11	CARBON	2.2K	5%	1/6W	
R326	1-247-866-00	CARBON	30K	5%	1/6W	
R327	1-247-867-00	CARBON	33K	5%	1/6W	
R328	1-247-851-00	CARBON	6.8K	5%	1/6W	
R329	1-249-421-11	CARBON	2.2K	5%	1/6W	
R330	1-247-871-00	CARBON	47K	5%	1/6W	
R331	1-249-421-11	CARBON	2.2K	5%	1/6W	
R342	1-249-421-11	CARBON	2.2K	5%	1/6W	
R343	1-247-853-00	CARBON	8.2K	5%	1/6W	

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R344	1-247-823-00	CARBON	470	5%	1/6W
R345	1-247-807-00	CARBON	100	5%	1/6W
R346	1-247-825-00	CARBON	560	5%	1/6W
R347	1-247-807-00	CARBON	100	5%	1/6W
R401	1-249-419-11	CARBON	1.5K	5%	1/6W
R402	1-247-829-00	CARBON	820	5%	1/6W
R403	1-247-863-00	CARBON	22K	5%	1/6W
R404	1-247-863-00	CARBON	22K	5%	1/6W
R405	1-249-429-11	CARBON	10K	5%	1/6W
R501	1-216-081-00	METAL CHIP	22K	5%	1/10W
R502	1-216-081-00	METAL CHIP	22K	5%	1/10W
R503	1-216-105-00	METAL CHIP	220K	5%	1/10W
R504	1-216-089-00	METAL CHIP	47K	5%	1/10W
R505	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R506	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R507	1-216-097-00	METAL CHIP	100K	5%	1/10W
R508	1-216-080-00	METAL CHIP	20K	5%	1/10W
R509	1-216-103-00	METAL CHIP	180K	5%	1/10W
R510	1-216-085-00	METAL CHIP	33K	5%	1/10W
R511	1-216-089-00	METAL CHIP	47K	5%	1/10W
R512	1-216-095-00	METAL CHIP	82K	5%	1/10W
R513	1-216-081-00	METAL CHIP	22K	5%	1/10W
R514	1-216-081-00	METAL CHIP	22K	5%	1/10W
R515	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R516	1-216-121-00	METAL CHIP	1M	5%	1/10W
R517	1-216-056-00	METAL CHIP	2K	5%	1/10W
R518	1-216-091-00	METAL CHIP	56K	5%	1/10W
R520	1-216-085-00	METAL CHIP	33K	5%	1/10W
R523	1-216-081-00	METAL CHIP	22K	5%	1/10W
R524	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R525	1-216-089-00	METAL CHIP	47K	5%	1/10W
R526	1-216-089-00	METAL CHIP	47K	5%	1/10W
R527	1-216-077-00	METAL CHIP	15K	5%	1/10W
R528	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R531	1-216-331-11	METAL CHIP	9.1K	1%	1/10W
R532	1-216-056-00	METAL CHIP	2K	5%	1/10W
R533	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R534	1-216-105-00	METAL CHIP	220K	5%	1/10W
R535	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R538	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R539	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R542	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R543	1-216-335-11	METAL CHIP	24K	1%	1/10W
R544	1-216-332-11	METAL CHIP	11K	1%	1/10W
R545	1-216-324-11	METAL CHIP	10K	1%	1/10W
R546	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R547	1-216-324-11	METAL CHIP	10K	1%	1/10W
R549	1-216-324-11	METAL CHIP	10K	1%	1/10W
R550	1-216-331-11	METAL CHIP	9.1K	1%	1/10W
R551	1-216-331-11	METAL CHIP	9.1K	1%	1/10W
R552	1-216-324-11	METAL CHIP	10K	1%	1/10W
R553	1-216-100-00	METAL CHIP	130K	5%	1/10W
R554	1-216-089-00	METAL CHIP	47K	5%	1/10W
R555	1-216-075-00	METAL CHIP	12K	5%	1/10W
R556	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R557	1-216-081-00	METAL CHIP	22K	5%	1/10W
R558	1-216-089-00	METAL CHIP	47K	5%	1/10W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R559	1-216-089-00	METAL CHIP	47K	5%	1/10W
R561	1-216-041-00	METAL CHIP	470	5%	1/10W
R562	1-216-542-00	METAL CHIP	12K	1%	1/10W
R563	1-216-333-11	METAL CHIP	15K	1%	1/10W
R564	1-216-333-11	METAL CHIP	15K	1%	1/10W
R565	1-216-542-00	METAL CHIP	12K	1%	1/10W
R566	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R569	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R570	1-216-107-00	METAL CHIP	270K	5%	1/10W
R571	1-216-104-00	METAL CHIP	200K	5%	1/10W
R572	1-216-104-00	METAL CHIP	200K	5%	1/10W
R573	1-216-102-00	METAL CHIP	160K	5%	1/10W
R576	1-216-081-00	METAL CHIP	22K	5%	1/10W
R577	1-216-080-00	METAL CHIP	20K	5%	1/10W
R584	1-216-077-00	METAL CHIP	15K	5%	1/10W
R585	1-216-097-00	METAL CHIP	100K	5%	1/10W
R586	1-216-081-00	METAL CHIP	22K	5%	1/10W
R587	1-216-089-00	METAL CHIP	47K	5%	1/10W
R588	1-216-083-00	METAL CHIP	27K	5%	1/10W
R589	1-216-121-00	METAL CHIP	1M	5%	1/10W
R595	1-216-097-00	METAL CHIP	100K	5%	1/10W
R597	1-216-097-00	METAL CHIP	100K	5%	1/10W
R598	1-216-105-00	METAL CHIP	220K	5%	1/10W
R599	1-216-105-00	METAL CHIP	220K	5%	1/10W
R601	1-216-065-00	(CD)...METAL CHIP	4.7K	5%	1/10W
R601	1-247-866-00	CARBON	30K	5%	1/6W
R602	1-216-059-00	(CD)...METAL CHIP	2.7K	5%	1/10W
R602	1-247-863-00	CARBON	22K	5%	1/6W
R603	1-216-338-11	(CD)...METAL CHIP	30K	1%	1/10W
R603	1-249-429-11	CARBON	10K	5%	1/6W
R604	1-216-338-11	(CD)...METAL CHIP	30K	1%	1/10W
R604	1-249-429-11	CARBON	10K	5%	1/6W
R605	1-216-065-00	(CD)...METAL CHIP	4.7K	5%	1/10W
R606	1-216-329-11	(CD)...METAL CHIP	5.1K	1%	1/10W
R607	1-216-085-00	(CD)...METAL CHIP	33K	5%	1/10W
R607	1-247-829-00	CARBON	820	5%	1/6W
R608	1-247-829-00	CARBON	820	5%	1/6W
R609	1-249-429-11	CARBON	10K	5%	1/6W
R610	1-216-097-00	(CD)...METAL CHIP	100K	5%	1/10W
R610	1-247-847-00	CARBON	4.7K	5%	1/6W
R611	1-216-065-00	(CD)...METAL CHIP	4.7K	5%	1/10W
R611	1-247-847-00	CARBON	4.7K	5%	1/6W
R612	1-216-097-00	(CD)...METAL CHIP	100K	5%	1/10W
R612	1-247-847-00	CARBON	4.7K	5%	1/6W
R613	1-216-121-00	(CD)...METAL CHIP	1M	5%	1/10W
R613	1-247-825-00	CARBON	560	5%	1/6W
R614	1-216-078-00	(CD)...METAL CHIP	16K	5%	1/10W
R614	1-247-807-00	CARBON	100	5%	1/6W
R615	1-216-057-00	(CD)...METAL CHIP	2.2K	5%	1/10W
R615	1-247-871-00	CARBON	47K	5%	1/6W
R616	1-216-069-00	(CD)...METAL CHIP	6.8K	5%	1/10W
R616	1-247-871-00	CARBON	47K	5%	1/6W
R617	1-216-069-00	(CD)...METAL CHIP	6.8K	5%	1/10W
R618	1-216-078-00	(CD)...METAL CHIP	16K	5%	1/10W
R618	1-247-831-00	CARBON	1K	5%	1/6W
R619	1-216-098-00	(CD)...METAL CHIP	110K	5%	1/10W
R619	1-247-879-00	CARBON	100K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R620	1-216-075-00	(CD)...METAL CHIP	12K	5%	1/10W
R620	1-247-849-00	CARBON	5.6K	5%	1/6W
R621	1-216-074-00	(CD)...METAL CHIP	11K	5%	1/10W
R621	1-247-867-00	CARBON	33K	5%	1/6W
R622	1-247-879-00	CARBON	100K	5%	1/6W
R623	1-216-053-00	(CD)...METAL CHIP	1.5K	5%	1/10W
R623	1-247-883-00	CARBON	150K	5%	1/6W
R624	1-216-078-00	(CD)...METAL CHIP	16K	5%	1/10W
R624	1-247-823-00	CARBON	470	5%	1/6W
R625	1-216-089-00	(CD)...METAL CHIP	47K	5%	1/10W
R625	1-249-421-11	CARBON	2.2K	5%	1/6W
R626	1-216-081-00	(CD)...METAL CHIP	22K	5%	1/10W
R626	1-247-853-00	CARBON	8.2K	5%	1/6W
R627	1-216-089-00	(CD)...METAL CHIP	47K	5%	1/10W
R628	1-216-047-00	(CD)...METAL CHIP	820	5%	1/10W
R629	1-216-037-00	(CD)...METAL CHIP	330	5%	1/10W
R630	1-216-018-00	(CD)...METAL CHIP	51	5%	1/10W
R632	1-216-080-00	(CD)...METAL CHIP	20K	5%	1/10W
R633	1-216-065-00	(CD)...METAL CHIP	4.7K	5%	1/10W
R700	1-216-097-00	(CD)...METAL CHIP	100K	5%	1/10W
R701	1-216-089-00	(CD)...METAL CHIP	47K	5%	1/10W
R801	1-247-811-00	(E,UK,AEP)......CARBON	150	5%	1/6W
R801	1-247-819-00	(US,Canadian)...CARBON	330	5%	1/6W
R802	1-249-429-11	CARBON	10K	5%	1/6W
R803	1-249-429-11	CARBON	10K	5%	1/6W
R804	1-247-827-00	CARBON	680	5%	1/6W
R805	1-247-879-00	CARBON	100K	5%	1/6W
R806	1-216-085-00	(CD)...METAL CHIP	33K	5%	1/10W
R806	1-249-429-11	CARBON	10K	5%	1/6W
R807	1-216-085-00	(CD)...METAL CHIP	33K	5%	1/10W
R807	1-249-429-11	CARBON	10K	5%	1/6W
R808	1-216-085-00	(CD)...METAL CHIP	33K	5%	1/10W
R809	1-216-331-11	(CD)...METAL CHIP	9.1K	1%	1/10W
R810 ⚠	1-202-858-00	(UK)...FUSIBLE	47		1/4W
R901	1-216-144-00	(CD)...METAL CHIP	5.6	5%	1/8W
R901	1-247-843-00	CARBON	3.3K	5%	1/6W
R902	1-247-863-00	CARBON	22K	5%	1/6W
R903	1-247-843-00	CARBON	3.3K	5%	1/6W
R904	1-247-825-00	CARBON	560	5%	1/6W
RV1	1-226-235-00	RES, ADJ, CARBON 5K			
RV1	1-230-518-11	(CD)...RES, ADJ, METAL GLAZE 220K			
RV2	1-230-518-11	RES, ADJ, METAL GLAZE 220K			
RV101	1-226-235-00	RES, ADJ, CARBON 5K (PLAYBACK LEVEL)			
RV102	1-226-237-00	RES, ADJ, CARBON 20K (RECORD LEVEL)			
RV103	1-226-240-00	RES, ADJ, CARBON 200K (RECORD BIAS)			
RV104	1-230-462-11	RES, VAR, SLIDE 100K/100K (10kHz)			
RV105	1-230-462-11	RES, VAR, SLIDE 100K/100K (4kHz)			
RV106	1-230-462-11	RES, VAR, SLIDE 100K/100K (1kHz)			
RV107	1-230-462-11	RES, VAR, SLIDE 100K/100K (400Hz)			
RV108	1-230-462-11	RES, VAR, SLIDE 100K/100K (100Hz)			
RV109	1-230-795-11	RES, VAR, SLIDE 20K (VOLUME)			
RV201	1-226-235-00	(G-AEP)...RES, ADJ, CARBON 5K			
RV201	1-226-850-00	(E,US,Canadian,AEP,UK)... RES, ADJ, CARBON 4.7K (PLAYBACK LEVEL)			
RV202	1-226-852-00	RES, ADJ, CARBON 22K (RECORD LEVEL)			
RV203	1-226-855-00	(E,US,Canadian,AEP,UK)... RES, ADJ, CARBON 200K (RECORD BIAS)			

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
RV209	1-230-795-11	RES, VAR, SLIDE 20K (VOLUME)
RV501	1-230-516-11	RES, ADJ, METAL GLAZE 10K (FOCUS GAIN)
RV502	1-230-517-11	RES, ADJ, METAL GLAZE 22K (TRACKING GAIN)
RV503	1-230-796-11	RES, ADJ, METAL GLAZE 4.7K (TRIANGLE WAVEFORM)
RV504	1-230-517-11	RES, ADJ, METAL GLAZE 22K (SLEDDING OFFSET)
S1	1-554-892-11	SWITCH, LEVER SLIDE (BAND SELECT)
S301	1-554-890-11	SWITCH, PUSH (1 KEY)(POWER)
S303	1-554-888-11	SWITCH, SLIDE (RECORD/PLAYBACK)
S304	1-570-199-11	SWITCH, LEVER SLIDE (FUNCTION)
S305	1-554-891-11	SWITCH, PUSH (1 KEY)(TAPE SELECT)
S306	1-554-889-11	SWITCH, PUSH (1 KEY)(DOLBY NR)
S307	1-554-798-21	SWITCH, SLIDE (ISS)
S401	1-553-856-00	SWITCH, KEY BOARD (REWIND)
S402	1-553-856-00	SWITCH, KEY BOARD (REVERSE PLAY)
S403	1-553-856-00	SWITCH, KEY BOARD (STOP)
S404	1-553-856-00	SWITCH, KEY BOARD (NORMAL PLAY)
S405	1-553-856-00	SWITCH, KEY BOARD (FAST FORWARD)
S406	1-553-856-00	SWITCH, KEY BOARD (PAUSE)
S407	1-553-856-00	SWITCH, KEY BOARD (RECORD)
S408	1-553-856-00	SWITCH, KEY BOARD (RECORD MUTING)
S409	1-553-856-00	SWITCH, KEY BOARD (SYNCHRO TAPE & CD)
S601	1-554-798-21	SWITCH, SLIDE (TIMER)
S602	1-554-893-11	SWITCH, LEAF (EJECT)
S603	1-554-889-11	SWITCH, PUSH (1 KEY)(DIRECTION MODE)
S701	⚠1-552-026-00	(E).....SWITCH, VOLTAGE CHANGE OVER
S901	1-554-929-11	SWITCH, LEAF
S902	1-514-346-00	SWITCH, LEAF (OPEN/CLOSE,CD PLAYER)
S903	1-553-198-00	SWITCH, LEAF
SP101	8-927-223-00	SPEAKER (WOOFER)
SP102	1-503-488-11	SPEAKER (TWEETER)
SP201	8-927-223-00	SPEAKER (WOOFER)
SP202	1-503-488-11	SPEAKER (TWEETER)
T1	1-404-249-00	COIL, FM
T2	1-406-040-00	COIL (OSC)
T3	1-404-552-11	TRANSFORMER, IF
T701	⚠1-448-278-11	(E)............TRANSFORMER, POWER
T701	⚠1-448-279-00	(US,Canadian)...TRANSFORMER, POWER
T701	⚠1-448-342-00	(UK)...........TRANSFORMER, POWER
T701	⚠1-448-343-00	(AEP)..........TRANSFORMER, POWER
TM301	1-536-705-00	TERMINAL BOARD (SP EAKER OUTPUT)
X301	1-527-948-00	VIBRATOR, CRYSTAL
X601	1-567-301-11	OSCILLATOR, CRYSTAL

ACCESSORY & PACKING MATERIAL

Part No.	Description
1-526-565-00	(E2)...AC PLUG ADAPTOR
⚠1-551-235-00	(E2)...CODE, POWER (DK-51) 2P
1-557-652-11	CORD, CONNECTION (SPEAKER)
3-527-213-00	LABEL, SERIAL NUMBER
3-760-375-11	(E,AEP,UK)...MANUAL, INSTRUCTION
3-795-308-51	(E2)...INSTRUCTION
3-881-644-00	PEOTECTION BAG
4-910-263-01	CUSHION (FRONT)
4-910-264-01	CUSHION (REAR)
4-910-265-01	CUSHION (UPPER)
4-910-297-01	(E,Canadian,AEP,UK)...INDIVIDUAL CARTON

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